JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL,

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VOL. XXV.

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"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted; and it will die away, if they shall entirely cease."—Sir Wm. Jones.

CALCUTTA:

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1857.

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JOURNAL

OF THE

ASIATIC SOCIETY.

No. I.—1856.

Report on the progress of the Magnetic Survey and the researches connected with it in Sikkim, the Khosia Hills and Assam, April to December, 1855.—*By* Hermann Schlagintweit, *Esq.*

From H. Schlagintweit *in charge of the Magnetic Survey of India.*

To Sir James Melvill, K. C. B. *Secretary to the Court of Directors of the Honorable East India Company, India House, London.*

Gowhatty, December 19*th*, 1855.

Sir,

I have the honour to present you a report of my proceedings, in that part of the Magnetic Survey of India which has been entrusted to me, during the period from March to December.

The report contains, besides an abstract of the chief results, the routes we have followed up to the present date.

We are spending the present winter months in Central Assam and along the Bhootan frontier, from hence I intend to proceed to Calcutta, in order to despatch the books of observations, plans, and drawings, as well as the collections of geology and natural history, to the India House.

From Calcutta I intend, after my plans have been presented as before in full detail to the Government of India, to proceed through Bengal to the western parts of the Himalayas.

I am particularly happy to mention the valuable assistance which I have received in every way from the Government of India.

I have the honour to be,

Sir,

Your most obedient servant,

HERMANN SCHLAGINTWEIT.

1.—*Routes and Geographical Remarks.*

I left Calcutta, April 5th, proceeding viâ Kishnagur, Dinagepore and Tytaliah, to British Sikkim. My draftsman, Abdool Cawder, went the same way, keeping one day's dawk distance in order to make corresponding barometric and other observations.

The assistant, Mr. Adams, went by the steamer to Caragola Ghat and viâ Purneah to Darjiling.

After a short stay in Darjiling and its environs, we proceeded up to the ridge, which branches off from the central mass of Kunchinjinga, and extends in a southerly direction, near the southern borders of the Sikkim Himalaya. Previous official propositions to the Sikkim Rájáh for permission to travel in his dominions were perfectly unsuccessful, though Dr. Campbell, Superintendent of Darjiling, most obligingly and with true scientific interest tried every way to forward my plans.*

The range extending from Tonglo over Chundunangee, Phulloot, Gosah, Singalelah to the mass of Kunchinjinga, allowed me not only to make a very complete set of comparative magnetic and physical observations at different heights, but these peaks commanded at the same time one of the most splendid views of the snowy peaks of the Eastern Himalaya, extending 20° East from Chumalari and 30° West from Kunchinjinga.

From the different points of the Singalelah range the height and position of the snowy peaks were most carefully measured with an

* During all the time of my operations in Sikkim, I enjoyed Dr. Campbell's as well as Mr. Hodgson's precious and unremitting assistance; I take advantage, with particular pleasure, of this occasion, to return my best thanks to both these gentlemen.

It is scarcely necessary to add how much I was assisted by Dr. Hooker's previous researches in this part of the Himalayas.

SECTION
Across the
BRAHMAPUTRA RIVER
Near the
Lighthouse on the Rocks at Cotton Gowhatty
for determining the form of the bed of the river & the quantity of water
By
Hermann Schlagintweit Esq.ª
Direction of the Section from N 29°.5 W to S 29°.5 E.
NOVEMBER 1855

SECTION
of the
SMALL NULLAH NEAR THE SUSPENSION BRIDGE
at the
West end of the Station of Gowhatty

0 100
Metres 10 20 30 40 50 60 70 80 90 10 20 30 40 50 60 Metres

Proportion of the Horizontal & Vertical dimensions as 1 : 250

No 1 Proportion of the Horizontal dimensions as 1 : 2000
" " Vertical 1 : 400

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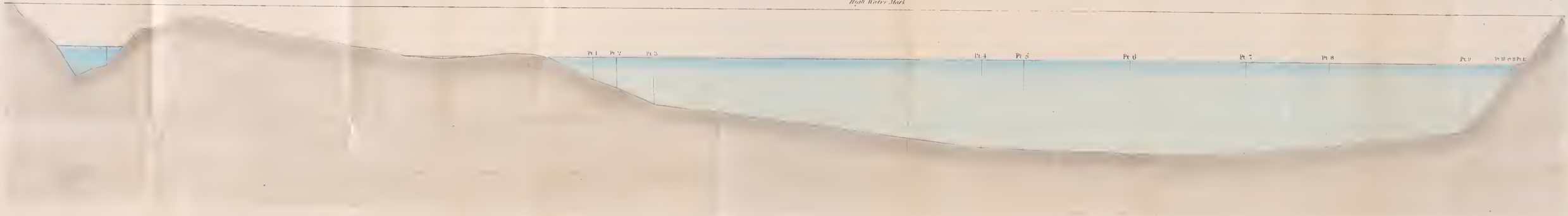

No 2 Proportion of the Horizontal and Vertical dimensions as 1 : 2000

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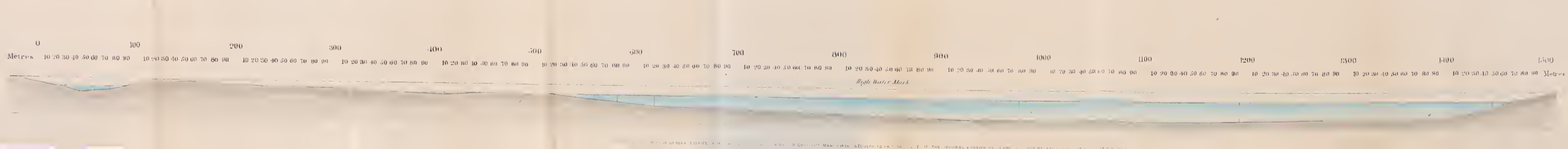

Ertel's universal instrument and a theodolite by Troughton and Simms.

The detail of these measurements has been combined with drawings, in which a given angular value was made equal to a unit of linear measure; in the coloured drawings of Tonglo and Phulloot one millemeter is equal to five minutes, and though by this scale the full panorama of 360° extended to a length of 4.2 meters, it allowed me, at the same time, to enter with full detail into the topographical structure of the district.*

I intended to proceed from Phulloot along the ridge, forming from that place the boundary between Nepal and the Rájáh of Sikkim's territories, over the summits as far as possible to the central groups, but we had been observed by the Nepalese (our fires during the night being seen) and there came up first a few Nepalese sepoys, and then a native officer with twenty sepoys, sent by Karak Bahadoor, whose corps was stationed near the Wallanchoon Pass, on the frontier of Thibet and Nepal. They at first seemed not disinclined to allow at least a limited progress, but soon after leaving Phulloot we were surprised by a man, who had evidently waited some days for our passing, who brought fresh orders for the sepoys, who had come up and were now accompanying us, absolutely forbidding them to allow us to go on.

After repeated negotiations, we succeeded in getting a few miles further, to the Chungtaboo mountain, where we were obliged to return, all supplies being denied us, and some of our coolies, who were Nepalese, being threatened that they would be made prisoners.

I returned to Darjiling after an absence of seven weeks and continued my stay in British Sikkim till the 15th August, occupied with another series of magnetic observations and in completing the materials for a map of equi-distant horizontal contour lines for British Sikkim.

* The drawings of the same range of mountains having been made from different points of known position, they form pictures complimentary to each other, like stereoscopic pictures, allowing me to lay down roughly in a map many more points, if required, than could be fixed by triangulation.

The number of drawings in Sikkim now deposited in the Surveyor General's Office is 100 to 120.

This map, in the scale of three inches to two miles, proportion 1 : 42240, was sent to Capt. Thuillier, Surveyor General's Office, Calcutta, where, through the kind assistance of Capt. Thuillier, copies are now being made which will be added to the next report.

We chiefly used a portable levelling instrument, consisting of a divided wheel and a diopter for tracing the level lines from 500 ft. to 500 ft. vertical distance; with these measurments were combined the determination of the incliuations of slopes by a very sensible Clinometer.

As the latter process gives very material assistance in cases where every point is not accessible (from want of roads as well as particularly from the luxuriant vegetation), I may mention in a few words how we proceeded to deduce from the inclinations the form of the lines required. The horizontal projection (P) of a unit of vertical height [500 ft. in the present case] varies with the inclination (I) of the surface, being the cotangent of the angle of inclination multiplied by the height taken as the standard (P = cot. I. × 500.)

Beginning therefore at a point whose height was measured and coincided with the full multiple of 500 ft., the projection in the map of the next point 500 ft. higher can be deduced from the formula above mentioned.

We calculated a table containing, in inches and its decimal fractions from degree to degree, the values of P reduced to the proportion of 1 : 42240 of which I give a few numbers as an example.

Angle of declivity. degrees.	Log cot.	Horizontal distance of two contour lines in the plan, inches.
0	∞	∞
10	0.7537	0.806
20	0.4389	0.390
30	0.2386	0.203
40	0.0762	0.169
50	9.9238	0.119

The points with which the steps from 500 ft. to 500 ft. coincided being thus found on the different slopes, their combination gives the equi-distant contour lines as an immediate result.

We left Darjiling August 19th to go by boat to the foot of the

Khosia hills. I followed the course of the Mahanuddy, Ganges, Megna, and Soormah rivers, whilst my draftsman went by the Teesta in order to make a plan of the river.*

We arrived at Sylhet September 23rd, and at Cherrapunji Sept. 29th.

After visiting the different places of particular geological interest near the Southern slope of the Khosia hills, and taking a series of angles to determine the positions of spurs descending from the plateau of Jynteah,* we passed through the interior of the Khosia hills and descended into the valley of the Brahmaputra at Gowhatty. As the conditions were here particularly favourable for calculating the discharge of water in the Brahmaputra, the river passing through a channel very well defined and pretty regular, we tried to determine its amount.

I found, per second,

318,200 cubic feet during the time of low water.

894,700 cubic feet during the time of high water.

A detailed account of the operations connected with this determination is given in the latter part of my report.†

We are now visiting the Northern part of central Assam near the Bhootan frontier, the Assistant, Mr. Adams and the draftsman, Abdool, are on their way to Jypore to see the coal and lime formation, at Namding. Their directions are to go from thence by the Boree Dihing and Noh Dihing to Sudeiya, and thence to Gowhatty.

II.—*Magnetic Observations.*

At Darjiling a complete set of magnetic observations was made immediately after our arrival in Sikkim from the 15th to 17th of April, and a second series after our return from the Nepalese frontier at the end of July; on the latter occasion three little houses of bamboo were built in order to protect the instruments for comparative observations on the daily variations.

2. At Tonglo complete observations from the 12th to 15th of May.

* This plan will also be added to the next report, it is now in the hands of Capt Thuillier, with the plan before mentioned.

† A section of the river 1 : 1000 and a plan 1 : 5000 added to the report.

3. At Phulloot [11,900 ft.] besides the determination of the declination, absolute intensity (by vibration and deflection), and dip, the daily variations of these elements were observed during a succession of five days.

4. For estimating the influence of height on the intensity of magnetism more directly, the passage of the little Rungeet, which lies between Phulloot and Darjiling, and which we reached a few days after leaving Phulloot, was particularly favourable, and careful observations of the deflection were made.

6. In order to compare the Himalayan station with the plains, a set of observations was made at Beriadangee, near Kissengunj on the shore of the Mahanuddy, and only sixty-six miles distant from the foot of the mountains in a direct line.

7. Rampore Bauleah—dip and vibration; the cloudy state of the weather by day and night prevented the determination of the declination.*

8. Cherrapunji complete observations.

9. Gowhatty * *

In the following, I give an abridged account of some results of these observations:

The calculations of the absolute value of these elements depend as well upon the change in the magnetism of the magnets employed, as upon the regular changes of terrestial magnetism, corresponding to the time of observation.

The latter element must be deduced hereafter from the observatories of Madras and Bombay; in reference to the magnets, all care has been taken to prevent irregular changes of magnetism, by a most careful transport, and by keeping a pair in one box (in opposite corners) the poles being in opposite directions.

The declination in Sikkim varied between 3° 9′ and 3°15′ for the different places of observation.

At Cherrapunji the declination was West, 2° 10′, a very unexpected result, probably connected with the amount of magnetic iron in the central parts of the Khosia hills, the sandstones of the plateau

* I was assisted here by Mr. Herschel, Mr. Adams being laid up with remitting fever.

No. 3

PLAN OF THE SECTION

ACROSS

THE RIVER BRAHMAPUTRA

near Gowhatty

455 Metres below the Light House

NOVEMBER

of Cherra, as well as the slates of Myrung, showing no trace of magnetism, even when pieces were brought nearly in contact with the dip needle, as well as with the horizontal magnet in the deflection apparatus.

At Gowhatty the declination was found to be 1° 41′ E.

The horizontal intensity of magnetism was found decidedly to decrease with the height, as resulting particularly from the observations on the little Rungeet, and at the summit of Phulloot, with a difference of level exceeding 10,000 feet. Before giving the amount of decrease in numbers, I wish to compare with my own the corresponding observations made by my brothers in the Western Himalayas.

The results of the determination of the dip also tend to show a decrease of the vertical force of magnetism.

I had at

Darjiling, April 19th, ...	36° 28·985.
July 30th, ...	36° 31·160.
Tonglo 10,000 ft. May 12th, ...	36° 22·04.
Phulloot, [the difference in latitude making the dip greater.]	
June 9th, ...	36° 46·875.

At the other stations the dip was the following:—

Beriadangee, Aug. 17th, ...	35° 11·595.
Rampore Bauleah, August 28th, ...	30° 57·75.
Cherra, October 23rd, ...	33° 34·26.
Gowhatty, December 10th, ...	35° 18·73.

Together with the magnetic observations, the meteorological elements, pressure, temperature, and moisture of the atmosphere, and the direction of the wind, were minutely observed and determinations of latitude and longitude combined.

III.—*Meteorology.*

A set of meteorological observations embracing the temperature of the air, the moisture, the pressure of the atmosphere, direction of the wind, and the temperature of the ground at different depths, had been made with great regularity in every place we passed through or where we made a stay.

I add to this report the hourly means of a set of observations

made in localities of particular interest on account of their height, Tonglo exceeding 10,000 ft., Phulloot nearly reaching 12,000 ft.

The thermometer readings in the following tables are corrected for the errors of the instruments, which had been most carefully ascertained before our departure from Europe at the Kew Observatory and examined during our stay in India every three or four months.

The readings of the barometer are reduced to the freezing point.

The instruments for determining the temperature of the ground were corrected of their index errors and also reduced to the true temperature of the stratum in which the bulb of the instrument stood, a correction instrument, containing only a capillary column of mercury without a bulb, being immersed in the same stratum.

In the following tables the variation is given for every full hour. The direct observations included the time from 5 A. M. to 10 P. M. Minima and maxima were also registered.*

These observations were projected on a paper covered with square millimeters, and the hourly changes for the hours without observations were read off from the curves traced out for every day.

At Tonglo I left an observer after our departure, and the observations have thus been continued there from May to August without interruption.

* Sometimes observations were made, but not so regularly, at different hours of the night.

I.

Temperature of the Air, Tonglo, from May 10th to May 16th inclusive.

	Hours. A. M.											
Means from	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 10 to 16.	6.75	6.87	6.85	6.78	6.75	6.92	7.91	9.03	9.83	10.61	10.81	11.83

Hours. P. M.												
N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
12.17	12.07	11.95	10.18	10.52	9.42	8.42	7.83	7.87	7.45	7.32	7.28	8.89

Phulloot, from May 20th to June 12th inclusive.

	Hours. A. M.											
Means from	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 20th to May 26th.	6.33	6.10	5 85	5.67	5.58	5.34	6.00	6.88	8.18	9.54	10.54	11.25
May 27th to June 1st.	6.05	5.93	5.82	5.89	5.80	5.93	6.63	7.48	8.42	9.18	10.00	10.88
June 4th to June 12th,	6.95	6.72	6.64	6.57	6.49	7.07	8.58	8.54	10.65	10.74	10.31	10.91

Hours. P. M.												
N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
11.28	11.17	10.54	9.60	9.03	8.60	8.17	7.83	7.48	7.14	6.74	6.59	7.93
11.62	11.60	10.31	9.64	9.06	8.50	7.84	7.28	6.92	6.70	6.36	6.18	7.91
10.41	10.31	10.51	10.11	9.71	9.45	8.62	8.12	7.82	7.54	7.30	7.08	8.63

NOTE. At the summit of Tonglo the observations on the temperature of the air, and on the moisture, on the temperature of surface of the ground, etc. had been continued by an observer left there till to our departure from Sikkim in August.

II.

Temperature of the ground, Tonglo, from May 10th to May 16th, inclusive, 1855.

SURFACE.

Means from May 10 to 16.	M. N.	1	2	3	4	5	6	7	8	9	10	11
	8.32	8.02	7.78	7.65	7.58	7.88	11.28	11.63	13.05	14.17	14.80	15.32

	N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
	15.73	16.03	16.05	15.08	14 25	13.00	11.10	10.28	9.73	9.28	8.93	8.60	11.06

0.3 *Meters below the Surface.*

Means from May 10 to 16.	M. N.	1	2	3	4	5	6	7	8	9	10	11
	10.82	10.82	10.72	10.78	10.78	10.75	10.73	10.73	10.77	10.90	10.90	10.98

	N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
	10.88	10.84	10.82	10.84	10.84	10.90	10.87	10.85	10.85	10.83	10.83	10.82	10.82

1.0 *Meter below the Surface.*

Means from	M. N.	1		3	4	5	6	7	8	9	10	11
May 11 to 16.	8.80	8.78	8.78	8.78	8.78	8.78	8.76	8.76	8.77	8.77	8.73	8.77

N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
8.77	8.76	8.76	8.76	8.76	8.78	8.74	8.78	8.78	8.78	8.78	8.78	8.78

Temperature of the ground, Phulloot, from May 20th to June 12th, inclusive.

SURFACE.

Means	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 20 to 26.	7.77	7.10	6.35	5.63	5.03	4 97	5.54	7.59	9.71	12.80	14.91	15.76
May 27 to 31.	8.68	8.36	8.06	7.84	7.80	7.98	8.72	9.62	11.26	12.86	14.16	14.94
June 3 to 9.	8.18	8.02	7.87	7.82	7 82	8.08	7.32	15.60	12.70	13.58	13.63	14.38
June 10 to 12.	8.67	8.40	8.10	7.90	7.87	8.07	8.60	10.50	12.30	14.75	14.50	15.55

No.	1	2	3	4	5	6	7	8	9	10	11	General mean.
16.21	16.30	15.43	14.63	13.77	12.76	11.83	11.07	10.36	9.96	9.00	8.41	10.54
15.80	16.00	15.34	14.58	13.74	12.00	11.18	10.68	10.20	9.75	9.40	9.12	11.17
13.60	14.55	15.72	15.37	14.19	13.30	11.34	11.61	9.39	6.23	8.46	8.33	10.71
16.00	15.15	15.50	14.95	12.75	12.25	11.85	11.40	10.80	10.35	9.95	9.60	11.49

0.3 *Meters below the Surface.*

Means	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 20 to 26.	7.05	7.05	7.01	6.98	6.93	6.88	6.93	6.60	6.59	6.63	6.70	6.73
May 27 to June1 ..	8.65	8.65	8.65	8.63	8.62	8.60	8.60	8.60	8.60	8.54	8.54	8.56
June 3 to 11.	9.40	9.37	9.37	9 36	9.35	9.34	9.34	9.3	9.36	9.38	9.38	9.41

N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
6.77	6.79	6.81	6 86	6.96	7.08	7.14	7.16	7.16	7.16	7.14	7.16	6.93
8.65	8.68	8.74	8.76	8.78	8.84	8.84	8.86	8.84	8.84	8.82	8.84	8.70
9.42	9.44	9.47	9.50	9.54	9.51	9.45	9.45	9.44	9.42	9.41	9.41	9.41

1 *Meter below the Surface.*

Means from	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 20 to 26.	4.60	4 60	4.61	4.61	4.61	4.62	4.62	4.62	4.62	4.62	4.62	4.64
May 27 to June 1.	5.70	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.62	5.66	5 66
June 3 to 11.	6.91	6.92	6.92	6.94	6.95	6.95	6.95	6.95	6.95	6.94	6.94	6.94

N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
4.64	4.64	4.64	4.64	4 64	4.67	4.70	4.71	4.71	4.71	4.72	4.72	4.65
5.66	5.66	5.66	5.66	5.68	5.72	5.72	5.74	5.74	5.74	5.76	5.76	5.70
6.88	6.89	6.89	6 90	6.92	6.93	6.94	6.94	6.97	6.97	6.97	6.97	6.93

III.

Daily variation of the Barometer—Millimeters reduced to 0° C=32° F., Tonglo, from May 10th to May 16th, inclusive.

Means from	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 10 to 16.	528.35	528.39	528.41	528.41	528.42	528.45	528.49	528,55	528.83	529.21	529.07	528.61

N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
528.71	528.80	527.67	527.24	526.74	527.05	527.71	527.67	527.87	528.10	528.22	528.29	528.21

Phulloot, from May 19th to June 12th inclusive.

Means from	M. N.	1	2	3	4	5	6	7	8	9	10	11
May 19 to 25, ...	496.04	496.08	496.12	496.08	496.23	496.18	496.30	496.46	496.59	496.67	496.68	496.59
May 25 to June 1.	495.94	495.95	495.97	495.99	496.03	496.13	496.67	496.17	496.32	496.69	496.81	496.81
June 3 to 12.	494.59	494.58	495.56	494.55	494.54	496 53	494.83	494.99	495.25	495.35	494.92	494.82

N.	1	2	3	4	5	6	7	8	9	10	11	General mean.
496.62	496.54	495.84	495.60	495.50	495.43	494.88	495.27	495.57	495.72	495.83	495.91	496.08
496.57	496.31	496.20	495.96	495.88	495.85	495.78	495.78	495.83	495.91	495.95	495.97	496.12
494.96	494.64	494.33	494.13	494.05	494.00	494.08	494.07	494.47	494.54	494.79	494.81	494.67

In the following resume I will try to collect, in the form of an extract from our journals, some meteorological phenomena which seemed to me particularly interesting, either in their more general character or from peculiarities characteristic of the regions explored.

Decrease and variation of the temperature of the air.

Comparing the Sikkim Himalaya in general with the plains, it is very manifest that the law of decrease of temperature for the annual and monthly means, as particularly for the extremes of single days, is a very different one from the plains to the range of mountains not exceeding 6000 or 7000 feet, and not very distant from the plains—and from these mountains to the higher parts of the central Himalayas. In the first case the decrease is much more rapid than in the second.

The temperature also of the lower part of the hills in the neighbourhood of the plains is frequently affected by the fog, which rapidly ascends along the slopes, and does not change the temperature of the air confined between the vesicles of vapour at a rate corresponding to the variation of their height.

A similar difference in the laws of decrease of temperature is also clearly observable in the *Khosia hills*, though on a smaller scale; their steep flanks facing the south, and the gentle elevations of the ridges based on the plateaux succeeding in the interior, present a configuration particularly adapted to show such modifications. In *Assam*, we got a very valuable set of meteorological observations communicated to us through the kindness of Col. Jenkins, which, combined and reduced by our own observations, will allow us to trace the thermic lines with great detail.

The temperature of the ground, of rivers, and of springs, has been always carefully observed.

I add, as an interesting object for comparison with the preceding tables, some numbers obtained in Gowhatty, Central Assam, the instrument being employed on ground covered with short grass.

Gowhatty, Dec. 1855.		Absolute Extremes. max.	min.
Surface of the ground, ...	6 A. M.	20.4	16.2
	10 A. M.	22.0	18.3
	2 P. M.	26.4	23.4
	6 P. M.	22.4	18.5
At 0.3 meters, (11.9 *inches*) below the surface,	6 A. M.	23.5	19.2
	10 A. M.	23.4	19.3
	2 P. M.	24.8	20.1
	6 P. M.	24.5	20.4
At 1 meter, (3 *ft.* 3 *in.*) below the surface.	6 A. M.	25.9	23.0
	10 A. M.	25.9	23.0
	2 P. M.	26.5	23.0
	6 P. M.	26.0	23.0

The temperature of the Brahmaputra near Gowhatty had a daily variation of 1° 6 between 18.0 and 16.4.

The height corresponding to a decrease in the temperature of springs of 1° C. is larger, the decrease is less rapid, in comparing Assam with the Khosia hills, than in comparing Sikkim with the plains of Bengal, in the latter case the corresponding height varied between 700 and 760 feet English.

The snow line could be very well measured and its variation ascertained during our stay on the Singalelah ridge, though we were prevented from proceeding ourselves to the foot of the snow.

We found a decided difference between its annual variation on the isolated peaks in the spurs of southern direction and on the flanks of the central parts. In the first case, the snow line goes steadily up till the beginning of the rains, and shows the great periodical oscillations, its maximum being attained near the middle of July. In the inner parts, much less accessible to the tropical rains, the maximum of snow line coincides with the end of August. In a lateral valley of Phulloot, a snow-bed was found in the beginning of June, but not lasting.*

* *Moisture of the atmosphere—rain, &c.* This snow, first seen by one of my shooters, was reported to me as an immense hailstone, the solid nature of the ice nearly concealing its origin; many reports of enormous hailstones, so often mentioned in the lower parts of the Himalayas, might probably be traceable to a similar origin.

Rain.—Many instances have been observed showing the quantity of rain to be sometimes of very local occurrence,* and its distribution as much modified by the configuration and topographical position of the surface receiving the rains, as by the more general laws of the movements of the atmosphere.

Places on a steep declivity facing large plains are particularly exposed to large quantities of rain, which exceeds, for instance, in Cherra, the annual mean of 600 inches.

It is very remarkable that at Cherra the proportion between the rain during the day and the night is on an average like 2 to 3, very often exceeding that proportion, but in the months after and before the rainy season, the daily variation of the heights of the clouds is quite different, the night being generally very clear and cloudless.

The great quantity of dew in the tropics seemed an object worthy of particular attention.

We tried in the Khosia hills, and afterwards in central Assam, to determine the quantity of dew; the details of one series of experiments are given in the following pages. I add that the absolute quantity is much inferior to what the first appearance of the substances exposed and the size of the drops made us expect, but a closer inspection explains it very well, by the distances of the drops from each other; a second experiment at Cherra gave for black wool 0.4 to 0.5 millimeters, one at Gowhatty 0.6, the quantity of water in the atmosphere decreasing with the mean daily temperature more rapidly than the radiating power increases with the elevation above the plains.

Experiments for the determination of the quantity of dew and the relative radiating power of different substances.

Night at Cherrapunji from 28th to 29th of October, perfectly clear, very small low cumuli, height not exceeding 3°, disappeared after 10 P. M.

Substances exposed at 7h. 30′ P. M. Oct. 28th. Taken to the balance at 10h. 10′ A. M. Oct. 29th.

The following substances were exposed.

No. 1.—Empty paper box.

No. 2.—Black wool (very fine black colour).

* At Darjiling we had on the 12th of August, 1855, 1.15 inches in two hours, and no rain fell at the military sanatarium not two miles distant.

No. 3.—White wool (very fine white colour).

No. 4.—Black vegetable earth (as formed naturally in little concavities of the rocks, not quite black, a little reddish).

No. 5.—Quartz sand from a river, formed of decomposed sandstone rocks.

No. 6.—Short grass, imitating the natural surface in the flat of Cherra by being cut off and arranged in the box points upwards.

No. 7.—Dark grey slate from Myrung with a very uniform smooth surface.

These substances were exposed in the following way. A double stratum of light bamboo mats was spread over short grass; length of the mats 25 meters, breadth 1.4 meters. The paper boxes were disposed so as to have the greatest possible distance from each other and from the borders of the mats.

The empty paper-box, weighed at the very beginning and at the very end, was during the night protected from radiation and dew by being placed on the grass, supported by a large cake of wax, and covered by a bamboo umbrella with a stick of 0.4 meter height.

In this way we obtained the changes of weight of the paper cases, produced by absorption during the night and evaporation during the stay in the room.

Weights.

	Increase of Weights in Grammes.
1.—Empty box weighed first and last for giving a correction for the absorption of moisture by the paper, ...	0.174
2.—Black wool, ...	4.019
3.—White wool, ...	3.791
4.—Black vegetable earth, ...	2.211
5.—Quartz Sand, ...	1.965
6.—Grass, ...	2.631
7.—Dark grey Slate, ...	0.904

The change of weight in the test paper box having been 0.174 grammes, this amount is to be deducted from all the substances from No. 2 to No. 6 inclusive. Besides this, the weights of the two kinds of wool and the grass must be corrected for a small, but appreciable, quantity of moisture lost during the stay in the room before

their turn came to be weighed; this quantity was ascertained by weighing them a second time, and putting the loss thus ascertained, during a given difference of time, proportional to the time which elapsed between the moment when they were brought into the room and the moment when their turn for being weighed came.

The corrections thus obtained are:—

	grammes.
For No. 2.—Black wool weighed first, ...	0.000
3.—White wool,.....	0.079
4.—Black earth,.....	0.012
5.—Quartz sand, ...	0.020
6.—Grass, ...	0.310

Dark grey slate could not be managed in the same way, the water being taken off by blotting. The loss may be considered as inappreciable, the water forming well defined drops not extended by capillarity over so large a surface as in the other substances.

The corrected increase of weight is therefore;—

	Difference between 1st & 2nd Weighing, grammes.	Correction for absorption grammes.	Correction for evaporation grammes.	Real increase grammes.
For No. 2.—Black wool,....	4.019	— 0.174	0.000	3.845
3.—White wool, ..	3.791	— 0.174	+ 0.079	3.696
4.—Black earth, ..	2.211	— 0.174	+ 0.012	2.049
5.—Quartz sand, ..	1.965	— 0.174	+ 0.020	1.711
6.—Grass,..... ..	2.631	— 0.174	+ 0.310	2.767
7.—Dark grey slate,	0.904	....	....	0.904

To facilitate the conversion of the weights in vertical heights of the stratum of water deposited in the form of dew, the boxes containing the different substances, as well as the stones, were made as nearly equal to a square decimeter as we could, but the moisture allowed the boxes to extend their edges, and it was not possible to mark the stones with sufficient accuracy without a useless waste of time, the real surfaces had therefore to be ascertained after the experiments. This was done by putting them on a paper covered with square centimeters and square millimeters, tracing the upper contour line, and counting the number of little squares thus enclosed.

The surface of the slate was found 100.54 square centimeters, the boxes on an average 101.75 square centimeters, varying only between 101.70 and 101.80 square centimeters.

The temperature of the air was

	Dry bulb.	Wet bulb.
October 28th 6 P. M.	15.6	13.6
October 28th 10 P. M.	13.6	11.8
October 28th to 29th, minimum,	12.9	
October 29th, 6 A. M.	14.4	14.2

Therefore the gramme of dew (distilled) water may be considered equal to one cubic centimeter without any correction for the change in the volume of water by temperature. The weight of the dew deposited is, after the reduction to 100 square centimeters;—

	grammes.
For No. 2.—Black wool,	3.78
3.—White wool,	3.63
4.—Black vegetable earth,	2.01
5.—Quartz sand,	1.68
6.—Grass,	2.72
7.—Dark grey slate,	0.90

Which gives the following thickness of the deposited stratum of water in millimeters and decimals of millimeters and in decimals of the English line (.1 inch);—

	M. M.	Lines.
For No. 2.—Black wool,	0.38	0.150
3.—White wool,	0.36	0.142
4.—Black vegetable earth,	0.20	0.079
5.—Quartz sand,	0.17	0.067
6.—Grass,	0.27	0.107
7.—Dark grey slate,	0.09	0.035

The radiating power may be considered as proportional to the quantity of water deposited. Making the quantity deposited on the black wool 1000, we get the following numbers corresponding to the different radiating powers.

Black wool,	1000
White wool,	980

Black vegetable earth,	527
Quartz sand,	447
Grass,	713
Dark grey slate,	233

Winds.

As an observation of a more general nature, I may mention that in Sikkim North winds are scarcely ever observed at heights below 10,000 feet, the large central masses protecting at a remarkable distance the lower ranges to the South of them.

In the valley of the Brahmaputra a regular daily variation takes place, particularly in the cold season.

During the day East and North-East winds follow the main direction of the valley, in the night South winds descend (which are the prevailing winds in the Naga, Khosia, and Garrow mountain ranges) into the valley of the Brahmaputra, after the ascending current has ceased. The Southerly wind does not follow immediately after sunset, but much later, from 9 to 10 P. M. This discordance in time seems to show that this phenomenon is caused to a great extent by the cessation of the ascending current in the lower part of the course of the Brahmaputra, where, during the day, an ascendant current is originated over a much larger surface. The daily variation of the barometer is decidedly affected by these changes in the currents of the air.

Composition of the atmosphere.

1.—Experiments have been made about the quantity of carbonic acid contained in the atmosphere, which increases decidedly at great heights and shows remarkably great variations in regions accessible to clouds rapidly ascending from the plains.

2.—Iodized papers (got directly from Prof. Schonbein) were regularly used for getting the measurement of ozon. At Darjiling, Calcutta, and Gowhatty continuous observations were made. In the plains, particularly in jheels, we found the colouration of the paper (the number increasing with the increase of ozon) to be 1 to 1.5;

at Darjiling . June, day 4.5 night 7.1.
July „ 3.3 „ 4.8.

At heights of from 10,000 to 12,000 feet, we got nearly always 10 (the last number of the scale) if the papers were exposed twelve hours; this allowed us to take a shorter time of exposition and to shew the variation at intervals of 3 hours during the day.

Electricity.

The most violent electric discharges take place immediately before the rains or at their first beginning.

In May I found the electricity on isolated peaks of 10,000 to 12,000 feet, in clear days, five times greater than in the plains.

Optical phenomena of the atmosphere.

The plains, as well as the mountains of Sikkim offered a great variety of interesting optical phenomena, of which the following may be mentioned in a few words.

The blue colour of the sky is in the plains of India much darker than in higher (Northern or Southern) latitudes, but the darkness of the sky does not increase with the height in the same ratio as in Europe. At heights of 10,000 to 12,000 feet, the absolute brightness of the sky is even greater than at the same height in Europe between 45° and 47° of North latitude.

The highest temperature we observed on a black bulb thermometer lying on black wool was 74° C. = 165° Fht, July, Darjiling, 7,200 ft. English.

During our stay at a greater height, we had never an entirely clear insolation after $11\frac{1}{2}$ A. M.

The second colouration of the snow after sunset had not been hitherto observed in tropical climates (see Humboldt's Cosmos, vol. IV).

We had some difficulty in observing this phenomenon, since at sunset it is generally very foggy in Sikkim; but on two occasions, particularly June 2nd from Phulloot, it was as plainly visible and as well defined as I ever saw it in the Alps. Besides this, I was told by Dr. Campbell, that after the rainy season it is very often to be seen extending over all the snowy peaks, and visible a considerable time after sunset.

The chemical action of light, determined as formerly described in our "new researches in Alps," was found in maximo to be number

58 of a coloured scale in the plains, and number 30 on Phulloot, decreasing consequently with elevation.

From Phulloot, a particular modification in the transparency of the air was observed June 4th. A few minutes after sunrise the shadow of the mountain was seen as plainly as possible, and nevertheless all the objects in the same direction were visible, only a little less distinct, through it, the fine haze being just thick enough to show the limits between its illuminated and shaded part, and allowing objects at the same time to be seen through it, as through a very thin curtain.

IV.—*Geological Observations.*

In Sikkim the rocks are all crystalline and metamorphic without limits so well defined as to enable me to distinguish them in a geological map; but in these districts, the direction of joints and cleavage showed many interesting relations with the form and direction of the valleys and with the inclination of the surface.

The cleavage has a predominant dip to N. 45° E. and is generally very steep, which causes not unfrequently the slopes of the mountains to be steeper, where they coincide with the direction of the surface of the stratification, than on the opposite flanks.

In the valley of the Mahanuddy, two miles below its junction with the Ratiang, a system of sandstone containing tertiary coal was examined.

The coal at this place is of very good quality, but does not reach the surface in very large masses; more of the same coal is to be seen on the left shore of the Mahanuddy.

The sandstones dipped to N. 6° E. inclination 30°; they are followed by marls, probably corresponding in age to the limestone overlying the coal in the Khosia hills.

In the Khosia hills, the valuable geological map of Mr. Oldham allowed of but few additions, and these particularly in reference to cleavages. I found one direction of the cleavage in the sandstones on the surface of the plateau of Cherra, coinciding with one system of cleavage in the gneiss at the foot of the hills; several other systems of cleavage are decidedly different in the different succession of rocks.*

* The collection of stones now sent to Calcutta contains 500 to 600 specimens.

The geological map of the Khosia hills was continued from Nunclow to the valley of the Brahmaputra.

V.—*Remarks on some hydrographic observations.*

The velocity of the current in different streams has been frequently measured and compared with the accumulation of deposits and size of boulders, with the depth of erosion, etc.

The quantity of the discharge has been determined in the Mahanuddy, the Ganges* near Rampore Bauleah, and the Brahmaputra near Gowhatty.

The Mahanuddy immediately below its junction with the Ratiang had a discharge of 240 cubic metres per second, and near the village of Sirsee below Malda 4,500 cubic metres per second, breadth 1,073 metres. For the Brahmaputra, the detail of the observations and the results obtained are given in the following pages.

Observations on the river Brahmaputra at Gowhatty.

The form of the valley of the Brahmaputra near Gowhatty is particularly well adapted for measuring the quantity of its discharge, the bed of the river being well defined, and the mass of water occupying only one channel. Besides, the station of Gowhatty being close to the (left) shore of the river, I had the advantage of getting much valuable information about the changes of the river in different seasons from the inhabitants. I mention particularly Major Vetch and Lieut. Craster, repeating my best thanks to them.

The observations were made from November 21st to December 13th the soundings November 28th and 30th, the determination of the velocity November 29th to December 3rd.

No. 1.—Breadth of the river.

The breadth of the river was ascertained by measuring a base line BE on the right shore and making a triangulation with a theodolite *reading* 10″ by the vernier.

* The observations on the Ganges have been sent to Calcutta, without the result being copied out for the report.

Angles

ABC = 76° 12′ 4″
BEA = 95° 35′ 11″
BAE = 8° 12′ 45″
= BAC + CAE
BAC = 4° 9′ 50″
CAE = 4° 2′ 55″

Length of B C = 113 meters.
„ C E = 113 „
„ B E = 226 „
Bearing of the line AD 150° 5′
i. e. S. 29° 55′ E. to N. 29° 55′ W.

These triangles give the following values for the real breadth, represented by the line AD.

		Meters.
△	BAE gives AD =	1531.5
△	BAC „ „ =	1531.7
△	CAE „ „ =	1526.5
	Mean	1529.9

This line is to be reduced by 42.9 meters, the theodolite not standing close to the high water mark on the left shore, and to be augmented by 22 3 meters on account of the instrument's position on the right shore, therefore we get as the resulting breadth from one high water mark to another, 1509 meters, 4951 feet.

Levellings in the bed of the Brahmaputra river at Gowhatty.

Distance—in metres.		Reading of levelling rod, left bank, metres.	Difference of level.		
			Positive metres.	Negative metres.	
0	4.9	0.14	1.402	..	Total height of
4.9	9.7	0.182	1.368	..	the left bank
9.7	16.5	1.080	0.470	..	from the water
16.5	22.22	0.747	0.803	..	mark.
22.22	29.44	0.074	1.456	..	
29.44	34.16	0.214	1.336	..	
34.16	41.63	0.230	1.320	..	
		First arm of water.			8m. 155
41.63	106.63				

Levellings over the Karmanásáh rock.

106.63	108.06	2.107	..	0.557	
108.06	110.08	2.121	..	0.571	Ascending parts.
110.08	118.23	2.113	..	0.563	6m. 376
112.23	114.16	2.155	..	0.605	
114.16	117.88	2.137	..	0.587	
117.88	122.60	2.156	..	0.606	
122.60	140.97	2.126	..	0.576	
140.97	149.89	2.076	..	0.526	
149.89	152.11	2.160	..	0.610	
152.11	157.14	2.115	..	0.565	
157.14	170.22	2.160	..	0.610	
170.22	195.12	0.860	0.790	..	
195.12	221.82	0.331	1.219	..	

Distance—in metres.		Reading of levelling rod metres.	Difference of level. Positive metres.	Difference of level. Negative metres.	
			2 009	..	Descending parts 7.761
221.82	241.25	0.346	1.204	..	
241.25	274.96	0.869	0.681	..	The water above forms during this season a lake, the depth of which does not alter so rapidly as the river. Ascending parts 0.474 Descendg. parts 0.499.
274.96	309.73	0.812	0.738	..	
309.73	332.47	0.255	1.295	..	
332.47	361.17	0.450	1.100	..	
361.17	380.99	0.816	0.734	..	
Second arm of water.				..	
380.99	453.27	Sand bank.		..	
453.27	484.57	1.929	..	0.379	
484.57	505.62	1.645	..	0.095	
505.62	522.07	1.051	0.499	..	..
Large mass of water. See compass bearings.					
Right shore from the water up to the high water mark.					Total of the ascending parts right shore 9.540.
0.	8.4	1.985	Here ends the steep bank, the slope of the following parts is 15° in an average.	0.435	
8.4	11.3	2.025		0.475	The basis of the masonry on which the light house stands is just passed by the highest water; ht. found above water 9m. 41.
11.3	14.22	2.011		0.461	
14.22	16.82	2.152		0.602	
16.82	19.22	2.148		0.598	
19.22	21.52	2.130		0.580	
21.52	22.62	2.149		0.599	
22.62	44.99	..		5.79	

No. 3.—*Soundings.*

First some soundings were made from a small boat; the boat not being provided with an anchor the angular distance between two objects on shore for ascertaining the exact place could not be taken with sufficient accuracy.

These points correct for depth are marked with dotted lines in the *plans*.

Then another set of soundings was taken, using a larger boat with an anchor, the position of the places was ascertained by bearings to the light house and the chimney of Major Vetch's house.

Light house from Major Vetch :—

Angular height of the white column, ...	31′ 30″
	metres.
Lineal height, ...	5 16
Bearing magnetic,.....	N. 22° 5 E.
Resulting distance, ...	563.2 metres.

The places of the soundings and the depth found are contained in the following table and laid down in the *plan* of the Section :

No. of the place.	Distance from the shores of the main branch of the Brahmaputra.		Distance from the line of the section in metres.	Depth in metres.
	From left shore in metres.	From right shore in metres.		
1	42.5 { measured	..	Below 15	4.5
2	65.0 { by a rope directly.	..	„ 17.5	5.8
3	90 to 110	..	„ 28.	9.3
4	420 5	..	Above 20.1	17.1
5	450 to 470	..	Below 180.	17.3
6	..	370 to 390	„ 230.	18.0
7	..	265 0	„ 102.5	17.8
8	..	170 to 195	„ 225.0	16.5
9	..	52.5	„ 111.5	14.0
10	..	15.0	„ 70.	5.0
11	..	8.0	„ 52.5	1.0
12	..	2.5	„ 40.0	0.5

Note.—No. A in the plan was above the island of Oommanand and a little to the right of it. Depth 12.5 metres.

No. 4.—*Velocity of the water.*

The following table contains the numbers found for the velocity of the water at different points. The velocity was ascertained, No. A for the surface by an empty pot (ghurrah), No. B for depths of 7.5 and 10.0 meters by bamboos loaded below with sacks containing sand and protected against their sinking deeper than their full length by a pot tied to the upper end, a thin and very soft rope, 100

meters long, was attached to the floaters so as to give as little resistance as possible to their progress.

Velocity of the Brahmaputra.

Points and total depth. (See plan and section.)	Velocity, meters in 1 second.				
	Surface.	Depth of 7.5 m.		Depth of 10 m.	
Pt. 1a, depth 12.5 m.	1.28	....		....	This water was stopped by the island Oommanand behind which the velocity was 0.
Pts. 1, 2, 3,....	Velocity 0, a little motion at about 30 m. from the shore, at 43 m. the vel. and depth the same as at pt. 4.				
Pt. 4 depth 17.1 m.	1.30	1.20 1.24	Mean 1.22	1.10 1.08	Mean 1.09	A very good point, full stream.
Pt. 7 depth 17.8 m.	1.42	1.30 1.30 1.28	Mean 1.30	1.20 1.23 1.21	Mean 1.21	Also quite regular full stream.
Pt. 9 depth 14.0 m.	1.15	1.20 1.25	Mean 1.22	130. 1.32	Mean 1.31	The lower currents here are more rapid owing to a tendency of the water to flow in the deep channel indicated by sounding, No. 8.
Pts. 10, 11, 12,..	Very slow motion, protected by a spur of the Ceela hill.				

Note.—The motion becomes 0 at about 50 meters distance from the right shore.

No. 5.—*Quantity of water.*

In the present state of the river, approaching pretty nearly its minimum of water, only the surface of the section of the main

stream can be taken into consideration in estimating the discharge of water, the Eastern part being formed by sand banks or still water.

The area of the section between the distance of 665 meters and 1420 meters from the left shore contains, as found by projecting it on paper where 5 square millimeters are equal to 1 meter square of the natural size,

8044 square meters.

This must be multiplied by the mean velocity.

The mean velocity lies, as an inspection of the table of velocities shows, between

1.0 and 1.2 meters per second

it can be determined more accurately by the formula

$$m = s - \sqrt{s} + 0.5,*$$

where m is the mean velocity, s the surface velocity in English inches per second, from which the meters are got by multiplying the result by .0254.

The surface velocity being 1.30, 1.42, 1.15 meters or 1.29 meters on an average, the resulting mean velocity is 1.12 meters a second.

This multiplied by 8044 the number of square meters as mentioned above gives as the *discharge of water* in 1 second of time.

9010 cubic meters = 318200 cubic English ft.

To get an approximate idea of the discharge during the greatest height of the water the following considerations may guide us.

The velocity in the main stream of the Brahmaputra during the height of the water after the rains, approximately ascertained from the rate of boats at the time of low and of high water is at least $\frac{3}{2}$ of what it is at present, a velocity, sometimes even exceeded in times of rapid rises of the river.

The increase of the section of the main stream between 665 and 1420 meters from the left shore is, as shown by the section 6750, square meters.

These multiplied by 1.68 gives an increase of water

= 11340 cubic meters.

* The bottom velocity "b," expressed by the formula $b = 2m - s$ becomes 0.95 meters per second.

From 1420 m. to the right shore the increase of the section is 248 square meters.

The depth being less, the velocity seems not much to exceed the present velocity of the main stream, which gives an increase of 248×1.12.

$= 277$ cubic meters.

The rest of the river to the left shore increases the section by 3270 square meters leaving out some shallow places close to the Kormonasah rock.

The velocity of this part being, particularly in the arm No. 1 of the section, very rapid is at least 1.5 meters, corresponding to a discharge per second of

4705 cubic meters.

Total increase 16320 cubic feet.

Approximate total quantity during high water,

25330 cubic meters.

or 894700 cubic ft.

Aborigines of the Nilgiris.—By B. H. Hodgson, *Esquire.*

English.	*Toda.*	*Kota.*	*Badaga.*	*Kurumba.*	*Irula.*
Air	Kátu (á=ou in bought)	Gálé	Glai (l particular sound	Gáli	Kátu
Ant	Erb	Irbé	Irúpu	Irupu	Iurmbu
Arrow	A'bu	Ambe	Ambu	Ambu	Ambu
Bird	Bilti	Péké	Hakibu	Hakibu	Páki
Blood	Bách	Netra	Netru	Netaru	Látta
Boar	Caret	Gaṇḍu paṇḍij	Gaṇḍ haṇḍij	Gand handy	Gándu pani
Bone	Elf	Yelave	Yellu, Illu	Yellu	Yellambu
Boy	Moch (lit. son)	Magé	Máti	Mati	Kúge
Brother	Ennon vót ó=german ó	Anna, Tamma	Kúda huṭṭidava	..	Aṇṇan, Tambri
Elder brother	Ennon etud	Aṇṇan	Aṇṇa	Aṇṇa	Aṇṇa
Younger brother	Ennon kinud	Királ	Tamma	Tamma	També
Cat	Koti	Písé	Koti	Koti	Púné
Child	Pópen, Enne	Mágé	Kúju	Kusu	Púllé
Male child	Moch	Gaṇḍu mage	Gandu kuju	Gandu kusu	Ampúlle
Female ditto	Kuch	Peṇṇe mage	Heṇṇu kuju	Heṇṇu kusu	Pompullé
Cow	Dánám	A'ye	Dana, Hasu	Dana	Mádu
Cock	Caret	Púse kóli	Húva, Húrja	Hunja koli	Javalu
Crow	Kák	Káké	Káké	Kaké	Káké
Day	Nál	Nálé	Dina, Jina	Dina	Nalu
Dog	Noi	Nai	Nai	Nai	Nai
Ear	Kevvi	Kivé	Kivé	Kivé	Kádu
Earth	Búmi	Búmi	Búmi	Mannu, Búmi	Bumi
Egg	Moṭṭe	Moṭṭe	Moṭṭe	Moṭṭe	Moṭṭu
Elephant	A'n	..	Aṇe	A'ṇe	A'ne
Eye	Kaṇṇ	Kaṇṇu	Kaṇṇu	Kaṇṇu	Kaṇṇu
Father	Eyan	Eyan	Appa, Tande	Tande	A'mme
Fire	Nebb, Dilth (th=English th)	Dijé	Kichchu	Kichchu	Tü, Tee

English.	*Toda.*	*Kota.*	*Badaga.*	*Kurumba.*	*Irula.*
Fish	Mín	Míné	Mínu	Minu	Mínu
Flower	Púf	Púve	Húvu	Huv	Pu
Fowl	Kúdi	Koli	Krovi (Badaga)	Koli	Koli
Foot	Kál	Kálú	Kálu	Kálu	Kálú
Goat	A'du	A'du	Adu	A'du	A'du
He goat	Caret	Gandadu	Hótu	Gandádu	Kaṭai
She ditto	Caret	Penádu	Henadu	Heñádu	Henádu
Hair	Mír	Míre	Mande, Kúdalu	Kudalu	Meiru
Hand	Koi	Kei	Kei	Kei	Kei
Head	Madd	Mandé	Mandé, Tálé	Mande	Télé
Hen	Caret	Pennekóli	Hette krovi	Kóli	Heñukoli
Hog	Pandij	Panje	Handij	Handij	Panni
Horn	Kuar	Kóbe	Kodu, Kombu	Kombu	Kombu
Horse	Kadarae	Kudare	Kudure	Kudure	Kudure
House	Todo house-A'rsh	Pei	Mane	Mane	Kúre
House of	Badaga house and Daórypálti; Europeans, or Bungalow-Kúaṭ	..	..	..	..
Husband	A'l	A'lé	Ganda	Maneava	Ganda
Iron	Kabbun	Ibbe	Kabbuna	Kabbuna	Irumbu
Leaf	Ersh	Yéllé	Yéllé	Yélle	Yélle
Light	Velaku	Belaku	Divige	Dípa	Valaku
Man	A'l	A'le, Manijon	Manija	Manisha	Manisha
Female	Kuch	Pemmage	Hennu	Hennu	Ponnu
Monkey	Turuni, Kódan, Pershk	Korté	Korangu	Korangu	Korangu
Moon	Teggal	Tiggulé	Tiggalu	Chandra, Tingla	Nálavu
Mother	Avv	Avve	Avve, Tai	A'vve	A'vve
Mountain	Bana, Dalta, Márshk	Vettumo	Betta	Bettu	Mélé
Mouth	Boi	Vai	Bai	Bai	Vai
Musquito	Chikattu	Chukattu	Chukattu	Súgane	Jollo

Name	Pér	Pér	Hesaru	Hessaru, Peru	Hessuru
Night	Kaggár	Kattale	Iru, Kattale	Iru	Rittu
Oil	Ennei	Yenne	Yenne	Yenne	E'nne
Plantain	Pávóm	Váhanne	Bláéhannu	Palehannu	Pálepámbu
Rice	Arshk	Akki	Nellakki	Nellakki	Arsi
Boiled rice	Tuaru	Kúve	Kru, Anna	Kúlu	Jóru
River	Pá	Peye, Pévi	Halla, Holla	Nirú	Pálla
Road	A'ldár	A'lâre	Dári	Dári	Beiee, Daḍḍa
Salt	Uppu	Uppu	Uppu	Uppu	Uppu
Skin	Tuvarsh	Tuval	Tólu	Tolu	Tolu
Sky	Bán	Vaname	Banu	Bana	Vánu
Sister	Enor vöt kuch	Keḍáse	Akka tange	Akka, Amme	A'kken, Tánge
Snake	Páb	Pábe	Hávu, Pámbu	Hávu	Pámbu
Sow	Pandi	Penavajé	Hennuhanḍij	Henhandy	Panni
Star	Mín	Míné	Mínu	Mínu	Vánu minu
Stone	Kall	Kallu	Kallu	Kallu	Kállu
Sun	Bírsh	Potte	Hottu	Hottu	Pódu
Tiger	Bürsh (ü = german ü)	Pujje	Huli	Huli	Pulli
Tooth	Párshi	Palle	Hallu	Hallu	Pallu
Tree	Maen (ae = german ä)	Marame	Mora	Mara	Mara
Village	Haṭṭi, úr	Paṭṭi	Haṭṭi	U'ru	U'ru
Toda village	Mort	Mande	Mandu	Mand	..
Water	Nír	Niré	Niru	Níru	Dani
Wheat	Gádubi	Godumbi	Godumbi	Godumbi	Godumbi
Wife	Kuigyó	Peḍe	Henḍaru	Henḍaru	Ponḍu
Yam	..	..	Mulingé	..	..
I	A'nu	A'ne	Ná	Nä	Nanu
Thou	Ní	Niye	Ní	Ni	Ni
He	Adum, Avan	Avane	Ava	Avanu	Ava
She	Adum, Adu	Avale	Avla	Avalu	Avla
It	Adum, Adu	Ade	Adu	Adu	Adu
We	Am, Em	Yenge	Yengla	Yenga	Navu

English.	*Toda.*	*Kota.*	*Badaga.*	*Kurumba.*	*Irula.*
You	Nív	Ninge	Ningla	Ninga	Nív
They	Avar adum	Avare	Avaka	Avaru	Aduru
Mine	Yennadú	Yennade	Yennadu	Yennadu	Nannadu
Thine	Ninnadu	Ninnade	Ninnadu	Ninnadu	Ninadu
His	Avandu	Avanade	Avanadu	Avanadu	Avanudu
Our's	Yemmadu or Nammadu	Nangudo	Yengadu, Nammadu	Yengadu	Nammudu
Your's	Nimmadu or Ningadu	Ningude	Ningadu	Ningadu	Nimmudu
Their's	Avardu	Avarado	Avaradu, Avakaradu	Avaradu	Avarudu
One	Vadd	Vodde	Vondu		Vondu
Two	Ed	Yede	Yeraḍu		Irndu
Three	Múḍu	Múnde	Múru		Muru
Four	Náṅk	Náke	Nalku		Náku
Five	ütsh	Anje	Eidu		Eindu
Six	A'r	A're	A'ru		Aru
Seven	El	Yéye	Yéllu		Elu
Eight	Ett	Yette	Yettu		Yettu
Nine	Anpath	Vorupáde	Vombattu		Vombadu
Ten	Path	Patte	Hattu		Pattu
Twenty	Evoth	Irvádo	Ibbatta	Ibbatu	Irvadu
Thirty,	Múbath	Múvatte	Muvattu	Muvattu	Mubbadu
Forty	Narshbath	Nalvatte	Nalvattu	Nalvatu	Nábadu
Fifty	E'both	Eivatto	Eivattu	Eivattu	Ambadu
Hundred	Vaddnúr	Núr	Nuru	Nuru	Núru
Of	N. M.	N. M.	Ya, Na	Ya, Na	No
	(N. B.—Genitive case scarcely used, the nominative case is used instead of it).				
To	Ge, G	Ge	Ga	Ge, Ko	Ke
By or from	Ind, Ar	Inde	Inda	Inda	Irinda, Inda
With, cum	..	Sengaḍa	Kóḍa	Sangaḍa	Kúḍa
Without, sine	Allade	Allado	Allade	Allade	A'dalla
In	Ult	Vollage	Vollage	Vollage	U'lle

like the numbers in Badaga.

On	Mél, Mok	Mélte	Méle	Méle	Méle
Now	Eni	Innale	I'ga	Igale	I'pa
Then	A'ni	Annale	A'ga	A'gale	Apale
When	Etvan	Yennale	Yégva	Yega	Yépa
To-day	E'du	Inde	Indu	Indu	Indu
To-morrow	Belkash	Nálke	Nále	Nále	Nále
Yesterday	Ennér	Nér	Ninne	Ninne	Nétu
Here	It, Ing	Iyáne	Illi	Illi	Inge
There	At, Ang	Alle	Alli	Alli	Ange
Where	Et	Yéye	Yelli	Yelli	Yénge
Above	Mél	Méle	Méle, Vodega	Méle	Mele, Móke
Below	Erg, Neshg	Kriyage	Kria	Kelage	Kálake
Between	Nárth, Káshi	Nadle	Naduve	Naduve	Naduve
Without, outside	Pormud	Porenje	Horasu	Honage	Valli
Within	Ulf	U'luli	Volage	Vollage	Ulle
Far	Podthdshi	Dúrame	Dura	Dúra	Dúra
Near	Keehuri	Vottle	Vottura, Sári	Pakkaru	Kitṭa
Little	Yeddi, Kinud	Kunade	Kuna, Konji	Vósi	Konja
Much	Upam	Yeddame	Tumba, Appara	Appara	Tumba
How much	Yet	Yéje	Yéja	Yesaga	Yettani
As	Yingei	Yete	Hyinge, Yetate	Yetate	Yepaḍi
So	Ingei	A'te	Hinge	Háge	Ipaḍi
Thus	Ingei, Angei	A'te, Angei	Háge	Háge	Ipaḍi
How	Hyage	Yége	Yétete, Hyage	Yetate	Yepaḍi
Why?	A'ed	Yendea	Yéka	Yéka	Yenna
Yes	Ha	Ha	Há	Haudu	A'ma
No.	A'	Illa	Illei	Illa	I'lle
Do not	Achadi	Véḍa	Béḍa	Bóḍa	Vánḍa
Or	Illade	Illave	Illave, Illadhóle	Innadhole	Illavitta
This	Avan	Avane	Avana	Avana	Ava
That	Adu	Adu	Adu	Adu	Adu
Which?	Yádu	Yéde	Yéaḍu	Yavadu	Yédu

English.	*Toda.*	*Kota.*	*Badaga.*	*Kurumba.*	*Irula.*
What?	E'n	Yéna	Yéna	Yéuu	Yenna
Who?	A'r	A're	Yáru	Yaru	A'ru
Eat	Thedth biné	Tiggene	Tinane		Tinke
Drink	Udth bini	Unikiene	Kuḍidane		Kúdike
Sleep	Vorehth bin or Vorginé	Pat kene	Voragine		Rombuve
Wake	Eḍaderth bini	Mekikene	Yleddane		Yélke
Laugh	Karth bini	Karsibe	Naggedane		Jirike
Weep	Aṭth bini	Attube	A'ltáué peculiar sound		E'ke
Be silent	Bokkiru	Bhévé	Súmagiru, Sappe niru		Summa iru
Speak	Eshth bini or Arversh bini	Mansbe	Nudi ḍane, Mátáḍine		Peshike
Come	It va	It va	Ite ba	like the Badaga verbs.	Iti ba
Go	At fo	At hógu	A'te hógu		Bho
Stand up	Mklo	Nitullé	Niddiru		Nike
Sit down	Neshkir	Kúsure	Kuli, Kútiru		Kukuve
I walk	Naḍedersh bini	Naḍegabe	Naḍedane	Naḍedane	Nadake
Run	Váḍu	Vóse	Vaḍu		Vóḍipoke
I give	Tashken	Kaḍube	Tauane	like the Badaga verbs.	Tarke
Take away	Ett fo	Ett hogu	Yettiund hogu		Ededu kondu poke
I strike	Puis bini	Puigabe	Huidane		A'dike
I kill	Bésht vers bini [biné	Taverigábe	Koddane		Kolluke
I raise	Túchs bine, Mokvers	Yetti gabe	Yettinetúkine		Yékkuke
I put down	Háks biné, Potsers biné [biné	Kriaga veigabe	Hakine		Irke
I hear	Kelth biné, Venatth	Vorutabe	Kretine, Voradiné		Kélke
I understand	Arth biné	Arsibe	Aridane		Arike
Tell	Binduḍverth biné	Peidibe	Hlegiue		Sellre
Good	Vulti	Volle	Volle	Volle	Nálla

Bad	Vollade	A'ga	Holla	Ketṭa	Polla
Cold	Perthti, Kuarthti	Jalli	Jalli, Kóravu	Jei	Jalli
Hot	Kásti, Kásviji	U'ri	Uri, Bissé	Bissé	Kája
Raw	Paji	Paje	Háse	Hasu	Paje
Sweet	Dijati	Sé	Sí	Si	Rúse
Sour	Pülthati	Pulsa	Hulli	Hulli	Pulli
Bitter	Káthti	Kaju	Káhi	Káhi	Késape
Handsome	Nárthti	Pasane, Singara	Singara	Singara	Alagu
Ugly	A'dádi	Máse	Holla	Hola	Polla
Straight	Caret	Hasia, Neṭṭu	Nettage	Neṭṭage	Neṭṭe
Crooked	Balug	Kénke	Gokke	Gokke	Kokki
Black	Kárthti	Kari	Kari, Kappu	Koppu	Kari
White	Belpu	Velape	Belapu	Bóle	Vélle
Red	Kebbu	Kembu	Kebbu	Kempu	Jevve
Green	Paje	Paje	Hase	Hase	Páje
Long	Nirigiti	Uddame	Udda	Udda	Uddya
Short	Kurigiti	Mone	Mone	Mone, Kúle	Kúle
Tall man	Nirigi ál	Uddaman	Uddava	Uddalu	Udda manisha
Short man	Kuruda moch	Mod ále	Moneava	Kúle alu	Kúle manisha
Great	Etud	Daḍḍa	Dadda	Doḍḍa	Doḍḍa
Round	Caret	Mudde	Urutu	Uruṭe	Ruṭṭe
Square	Caret	Saṭṭe	Jauka	Jauka	Javuka
Fat	Bechiti	Porále	Kobbu	Gobbu	Kolupu
Thin	Kinud	Vottale	Kuna	Melle	Vadage
Thirst	Nirchásti	Arthóje	Arupu	Arupu	Véke
Hunger	Bír erthti	Peṭṭi hoje	Hasu	Hasu	Passi
Weariness	Caret	Salupu.	Salupu	Salupu	Salipu

The difference of the several dialects of the hill tribes consists not exactly in the idiom of the languages but chiefly in their pronunciation. Therefore, the same or nearly the same word in the mouth of a Toda with his pectoral pronunciation can scarcely be recognized as the same in the mouth of the Kotas with their dental pronunciation. The Badaga and Kurumba dialects are midway between the former two, with regard to pronunciation; only the Badaga is a little more guttural than the Kurumba. There is a little difference in the dialects of the several Badaga tribes, those who came at a later period to the hills, for instance the Kangaru "(Lingaites)," who emigrated from Targuru, speaking a purer Canarese than the common Badagas.

The Todas also have some slight difference in their pronunciation according to the different districts they inhabit, for instance some pronounce the *s* quite pure, others like the English *th* and others like *z*.* The names of the Toda tribes are not quite correct in the letter of Mr. Hodgson. Thy are the following five: Peikee, Kenna, Pekkan, Kuṭṭan, Tódi. The chief tribe is the Peikee, which pronounces the s like th.

* The *th* English is more especially Burmese; the rest is generally true of the northern tongues, which, even when they possess an ordinary sibilant series, prefer the use of the equivalent *z* series, or *z*, *zy* (Ellis' *zh*) and *dz*, whereof the first is a simple sound; the second a sliding sound as in *azure*, *pleasure*, English, and = the French *j* in *jeu*; the third is the harsh modification of the sound. Several consonants besides *z* take the sliding sound represented by the blended *y*. This modification of the primitive sound of the precedent consonant may be seen in respect to the consonant *p* in the English *pure*, and *puling*, which I write *pyur* and *pyuling*; and so of all consonants followed by *y*. Another almost universal trait of Tartaric phonology is the exceeding commonness of the French *eu*, as heard in *jeu* aforesaid. In the above paper, I have not thought it prudent to meddle with Mr. Metz's orthography.

Aborigines of the Eastern Ghâts.

To the Secretary of the Bengal Asiatic Society.

Sir,—Pursuant to my purpose of submitting to the Society, upon an uniform plan and in successive series, samples of all the languages of the non-Arian races of India and of the adjacent countries, I have now the honour to transmit six more vocabularies, for which I am indebted to Mr. H. Newill of the Madras Civil Service, at present employed in Vizagapatam. These six comprise the Kondh, Sávara, Gadaba, Yerukala and Chentsu tongues. In forwarding them to me, Mr. Newill, a very good Telugu scholar, has noted by an annexed asterical mark such words of these tongues, and particularly of Yerukala, as coincide with Telugu. He has also remarked that many of the Chentsu vocables resemble the Urdu.

Having, as you are aware, a purpose of submitting to the Society an analytical dissection of the whole of the vocabularies collected by me, I shall be sparing of remarks on the present occasion. But, I may add to Mr. Newill's brief notes, a few words, as follows :

The Chentsu tribe, whose language, as here exhibited, is almost entirely corrupt Hindi and Urdu, with a few additions from Bengali, affords one more example to the many forthcoming of an uncultivated aboriginal race having abandoned their own tongue. Such relinquishment of the mother-tongue has been so general that throughout Hindustan Proper and the Western Himalaya, as well as throughout the whole of the vast Sub-Himalayan tract denominated the Tarai, not excluding the contiguous valley of Assam, there are but a few exceptions to this the general state of the case, whilst in the Central Himalaya the aboriginal tongues are daily giving way before the Khas language, which, though originally and still traceably Tartaric, has been yet more altered by Arian influences than even the cultivated Dravirian tongues. The very significant cause of this phenomenon it will be our business to explain by and bye. In the meanwhile the fact is well deserving of this passing notice, with reference to the erroneous impression abroad as to the relative amounts of Arian and non-Arian elements in the population of India,—an impression deepened and propagated by the

further fact, still demonstrable among many of these altered aborigines, of the abandonment of their creed and customs, as well as tongue, for those of the Arians. We thence learn the value in all ethnological researches, of physiological evidence, which in regard to all these altered tribes, is sufficient to decide their non-Arian lineage and to link them, past doubt, with the Himalayan and Indo-Chinese conterminous tribes on the east and north. It should be added, however, that, in a sheerly philological point of view, it becomes much more difficult to determine who are the borrowers and who the borrowed from, when both are non-Arians, than when one is Arian and the other non-Arian; and that, for instance, and in reference to the present vocabularies, we can decide at once that the Kondh numerals (save the two first), are borrowed from the Arian vernaculars, whereas it is by no means so certain that the Gadada and Yerukala numerals are borrowed from the Telegu and Karnatic respectively, merely because they coincide; and so also of the pronouns where the same coincidence recurs. All such questions however, are subordinate and secondary; and if we succeed in determining with precision, by physiological, lingual, and other helps, the entire Turanian element of our population, we shall then be able to advance another step and show the respective special affinities of the several cultivated and uncultivated Turanian tribes of India to each other and to certain of the tribes lying beyond India towards Burmah and Tibet, with at least an approximation to the relative antiquity of the successive immigrations into India.

A word in defence of these vocabularies of which the utility has been impugned, and impugned by special comparison with brief grammatical outlines.

When I commenced this series of vocabularies I expressed as strongly as any one could do the opinion that their utility must be circumscribed; and that the ethnology of India would only then be done complete justice to, when every branch of the subject should be carefully and simultaneously studied, upon the plan exemplified in my work on the Kooch, Bodo and Dimal. Much and toilsome labour has, however, since then, convinced me that enquiries confined wholly to India and its immediate vicinity would yield results far less satisfactory than such as should be greatly more extended even

if they were less complete; whilst these continued labours have more and more satisfied me that limited grammatical comparisons are much more apt to give rise to error, than limited glossarial ones. Perhaps the fascination of such extended enquiry may have somewhat biassed my judgment; but I am still decidedly of the opinion that the true relations of the most shifting and erratic, the most ancient and widely dispersed branch of the human family cannot be reasonably investigated upon a contracted scale, while the subject is so vast, that one must needs seek for some feasible means of grasping it, in sufficient amplitude to comprehend its normal character (a thing rather of surface than of depth), at the same time that one neglects not more complete and searching investigation of certain actual or supposed characteristic samples. Such is the course I have been pursuing for some time past. I have examined and am still examining the complete grammatical structure of several of the Himalayan tongues; and I have at the same time submitted the whole of my vocabularies to the alembic of comparative analysis. I hope soon to be able to present the results to the Society. Those of the analysis have been fruitful beyond my hopes, owing to the extraordinary analogy pervading the Tartaric tongues in regard to the laws which govern the construction of all their vocables save the monosyllabic ones, which are very rare. Even a superficial examination of the vocabularies suffices to indicate this prevalence of common constructive principles, and to such persons as have neither time nor skill to trace and demonstrate those principles, the mere collocation of the terms as they stand, if done on a sufficiently ample scale, will afford such evidence of general relationship and family union between the whole of the Indian aborigines and the populations of Indo-China, Sifan, Tibet, and Himalaya, aye and of China also, as philological superciliousness will seek in vain to ignore; and still more so, will the results of the analysis, empirical though that analysis must to some extent be admitted to be. It may be conceded at once, that these vocabularies must necessarily contain a good deal of error which could only be completely avoided by a perfect knowledge of each recorded tongue on the part of its recorder. But, as the languages are counted by hundreds, and as very few of them ever were or ever will be cultivated either by those

who speak them or by others, it is obvious that such precision can never be reached. On the other hand, it is certain that practical results of great value have been reached by a much less superfine process than that insisted on, and that, if we suppose some thousands of facts, so simple in their nature as the mere vocables of a language are, collected with ordinary care, their failing to subserve effectually some of the highest ends of ethnological science, more particularly if taken in connexion with other available evidence, must result rather from the incompetency of him to whom they are submitted, than from their own intrinsic deficiency. Vocabularies illustrate one another and furnish to the skilful no small means of correction of palpable errors, if sufficiently numerous. They also furnish means of sound induction from analogy, as I hope to prove by and bye beyond the possibility of cavil.

In a word, vocabularies seem to me very much like the little instrument which Hamlet puts into the hands of Polonius; a mere bit of perforated wood, which yet in competent hands can be made to discourse sweet music. Nor can I avoid some emotions of surprise and pain (for to disparage vocabularies is to discourage their collection) when I see learned men citing with applause the inferences built upon a few doubtful words picked out of a classic writer, or perchance out of some old map, and which yet are supposed to furnish sufficient evidence of the affinity of a lost tribe, renowned in the history of past times, whilst these same learned and eminent men allow themselves to speak of vocabularies containing some hundred of words, carefully selected and deliberately set down from the mouths of those to whom they are mother-tongues, as if these vocabularies could not furnish any legitimate basis for inference respecting ethnological affinities. But the objection adverted to is sufficiently answered by the valuable purposes which my series of vocabularies, long before completion, and with little or no resort to analysis, has been made actually to subserve; and therefore, I trust, it is no presumption in me to expect to be able to educe yet more ample and important results from their careful analysis* after com-

* I subjoin a sample or two of my method of dealing with the vocables, to demonstrate, 1st, identity of roots, 2nd, identity of adjuncts, 3rd, identity of constructive principles.

pletion. Fresh ones continue to flow in upon me still, and I have obtained not less than thirty, almost all new, since my analysis was nearly completed. This is the reason why it has been withheld—

Sá, Burmese, a son.
A-sá, Ku-sa } Limbu { a child. a son.
Ku-sú, Karnatak, a child.
Ku-sé, Mikir, ditto.
Ku-ko-s′, Oraon, ditto.
Ta-ng-ko-s′, ditto, ditto.

Sa (vel *chá*) is the root. It means a non-adult. *Ka* vel *ga* is the indefinite article; and *a*, the definite, or its equivalent = my, so that *ku-sa* is any child, and *a-sa* my child. *Ta* is = *ka* and both take the nasal appendage, *n*, *ng*, or *m*. Oraon iterates the prefix and elides the vowel of its root: *ta-ka-sa* = *ta-ga-pa* below.

Pá, passim, father.
Ta-pé, Gyarung, ditto.
Ka-pá, Kassia, ditto.
Ta-ga-pá-n, Tamil, ditto.
Wa-pé, Gyarung, ditto.
U-pá, Hayu, ditto.
W-ab, Circassian, ditto.
U-pá, Chintang, ditto.
O-pá, Rangchhen, ditto.
U-pá-p, Thulung, ditto.
U-ka-pá, Kassia, ditto.
Ap-ó, Chowrasi, ditto.
A-pa, Waling, my father.

The root speaks for itself, Gyarung has the *ta* and Kassia the *ka* prefix. They are commutable *ta* vel *da* and *ka* vel *ga*, and the use of both is normal. Tamil exhibits both and also the nasal suffix. The *ta* vel *ka*, used as an indefinite article is a contraction of the 3rd pronoun, another form of which is *ú* vel *ó* vel *w*. Hence *u-pa*, *o-pa*, *wa-b* vel *wa-p*, *ta-pa* and *ka-pa* = pater illius vel istius, pater cujusvis, *a* father whilst *á-pá* = my father as above. Thulung iterates the root, and Kassia the articular prefix, like Tamil *u-ka-pa* = *ta-ga-pa*.

Yí-n, Yú-n } Chinese { Mankind, the species.
E-yá-n, Toder, father.
You-k, Burmese, man, the male.
Yó, Savara, woman, mother.
Yú-m, Tibetan, ditto.
A-yú, Ta-yu } Lepcha and Tamil { a wife. a woman.
Ta-yí, Karnatak and Yerukala, a mother.
Ta-ng-yó, Oraon, a mother.
Ta-í, Tha-í } Khyi or Kassia, Malabar } a mother: í = yi.

Ya, *yu*, *yi* the root = man the species, or the male or female, or the emphatic female, viz. mother. Chinese, Burmese and Tibetan have the suffixual definitive; *m* = *n*, as in Chinese and Tamil supra: k suffix, the same as *k* vel *g* prefix supra, such transposition being normal and exemplified in *ap-o* = *u-pa* = *wa-b*, supra. Observe that the use of the prefixual *a* and *ta*, as respectively definite and indefinite articles, is common to Tamil, Lepcha and Limbu. I might add Burmese, &c. &c. Malabar has *ta* prefix aspirated.

Er = Ré, Onigur, man.
Ar = Rá, Mikir, ditto.
Ir = Rí, Bhaskir and Nogay, ditto.
A-ir = a-ríj, Armenian, ditto.
E-ri-l, Ho, ditto.
E-ré-l, Sontal, ditto.
E-ro-s, Hungarian, virilis.
Wi-ró, Scythic, man.
U-rí, Kasikumak, man.
G-rí, Kocch and Dimal, Pater familias.
G-rá, Bodo, head of pagus.
E-ri-n, Kasikumak, man.
T-ri-n, Shan, ditto.
Ta-n-d-rí, Telugu, father.
Ta-g-rí, Lepcha, man, father.

The *rá*, *ré*, *ri* root for mankind is palpable throughout and the prefixes and suffixes, as well as the cumulation of the former, are normal and therefore harmonize with the preceding samples; thus *t-rí*, *g-rí*, *ta-g-rí* respond precisely to *tá-pa*, *ka-pa*, *tá-gá-pá* aforegone, while the *n* suffix of Shan *trí-n* = the Tamil *n* in *tagapa-n* not less than the Telugu *n* in *ta-n-dri*. *A* vel *e* and *u* vel *w* prefixes recur just as in *a-sa*, *a-pa*, *a-yu*, *e-ya-n*, *u-pa* and *o-pa*. So also the nasal infix, whilst the suffixed labial and sibilant are as normal as the other adjuncts.

this, and the daily increasing skill in the use of that most potent of instruments, extended comparative analysis. But I cannot now

The above samples are selected out of thousands whereby collectively perfect proof is afforded that Tartaric vocables are every where subject to identical laws of construction and built out of identical materials. In the absence of books of authority to cite, the demonstration must of necessity be par la voie du fait, and depend on the fitness and number of instances. I am prepared with thousands of instances whose applicability or fitness will, I think, be allowed to be irresistibly convincing. Though we have good grammars, dictionaries and books on some few of the many tongues I cite, I am not aware that the composition of vocables has at all engaged the attention of their authors. It is the rock I build on.

Addenda—Under the head *Sá*, Burmese, a son, add

Sá-u, Thai, a son.
O-su, U-sa, Lazic, a child.
D-si, vel D-zi. Kuanchua, a son.
T-sé, T-sé-i, Kong, a child.
D-chú-i, Mantchu, ditto.
Chó-a, Kocch, ditto.
Kó-a,* Hó, a child.

* *Sá* = *chá* on one hand and *ká* on the other. The soft *sa* passes into *za* or *zya* (French j); and the hard *cha* into *ka*, as in church = kirk. Thus *Ho Kó* = *Kocch Chó*, as surely as the suffix *á* = the prefix *a*, whether used as a definitely *or* indefinitely definitive article: *á-yú* Lepcha, a wife, shows it as quasi definite whilst *á-kap*, a child, gives the *a* an indefinite sense rather; and *a-nak* in Lepcha and Burmese = the black, or a black one, is used either way.

The prefix *da* vel *ta*, by elision *d'*, *t'*, is as common a definitive, as *ka* vel *ga* with which it is constantly interchangeable, or both are given, as in *ta-pa*, *ka-pa*, *ta-ga-pa*; and *á* vel *é* prefix has often the indefinite article sense, and thus also is used indifferently with *ta* and *ka*, thus Burmese *a-yen* vel *ka-yen*, an aborigines; and thus *ta-vó* vel *ka-vó*, a bird in Bugis. The most common of definitives which are tantamount to articles usually indefinite, are, *t* vel *d*; *k* vel *g*; *n*, *ng*, vel *m*; *p*, *b*. *v*. vel *w*; *r*, vel *l*; and the vowels *i*, *e*, *a*, *u*, *o* which are all nearly commutable as being in origin = ille, iste. And all are liable to transposition and thus to become suffixes, as well as to be *repeated* both prefixually and suffixually as in Chinese *t-se-i* and Mantchu *d-chu-i* where *sa* vel *cha* = little, is the crude, and *t-se-i*, vel *d-chu-i*, precisely our English "a little one." That this is so, compare Chinese *tá* = great and *sé* = small with Newari *tá* and *chí* having the same sense. Newari takes the *ka*, *ga* suffix, like Mantchu, thus *chi-ki* small, and *d-cha-ka* a thing, in those tongues respectively.

Under the head *Yu-n*, mankind, after the word *You-k*, Burmese, add the word—

K-yó-ga, Tibetan, a man, the male.

Tibetan *k-yó-ga* from the *yá*, *yú*, *yó* crude, shows the *ka* vel *ga* definitive in both forms (soft and hard) and in both positions (prefix and suffix). The correspondent word for the female is *ki-mi* = *ka-mi* in Kassia and not less = *ka-mi* and *ku-mi* in the tongues so named after the name for our species in them. The sexual distributive use of *ka* and *u* prefixes in Kassia is only of secondary

expect and hardly desire any more new materials, and I hope therefore, soon to be able to submit my examination of the whole.

value, like the prefixual or postfixual position of the definitives, thus *ap-o* in Chourasi and *o-pa* in Rungchhen, = pater istius or ejus pater, viz. a father, any one's father, are from mere dialects of the same tongue or Kirunti. Thus also *Sa-u*, *Thai*, filius ejus = *U-sa*, *O-su*, Lazic. Compare *Yo* and *K-yo* with *Mari* and *K-mari*, *Lu-n* and *K-lu-n*, &c. apud Mongol Affin. of Caucasians, Journal for January, 1853.

Vocabulary of some of the Dialects of the Hill and wandering tribes in the Northern Sircars.

English.	*Kondh.*	*S'avara.*	*Gadaba.*	*Yerukala.*	*Chentsu.*
Air	Billu	Ringe	Gamváyi	Gáli*	Batás
Ant	..	Bobo	Gusálá	Chíma*	Peppide
Arrow	Pinju	A'm	Sonai	Yikke	Kondu, Kánd
Bird	Propámannéru	Onti	Piti	Kokku, Sogide, Kunju	Chodai
Blood	Rakko	Miyamo	Yignam	Regam, Vudaram	Lahu
Boat	Tekkinga	Vodá*	Dóna	Padava*	Lá
Bone	Pásu	Ajágna	Vondrámgóyi	Yamaka*	Had
Buffaloe	Kóru	Bognátel	Vontsani	Barre*	Mohis
Cat	Miyó	Rámegná	Girem	Púna	Billeyí
Cow	Kháyi	Tangli	Bandí	Alamádu, Pútamádu	Gáyi
Crow	Káka	Káká	Guggá	Selán Káka†	Kovvá
Day	Vujjyágu	Tambá	Simmyá	Pammárú,‡ Pangámáru	Din
Dog	Nahudi	Kencho	Guso	Náyi	Kukkúr
Ear	Kirru	Luv	Nintiri	Sóyí	Kán
Earth	Táná	Labo	..	Tarra	Bhúyi
Egg	Vatánga	Are	Mittá	Mutta	Dimma
Elephant	Hattanga	Ra	Kom	A'na	Hate
Eye	Kannuka	Amu	Olló	Supán	A'yenkhi
Father	Abbá	Uwá	Abbá	A'va	Bá
Fire	Nádi	Tógo	Sungol	Nerupu	Agin
Fish	Mininga	A'yo	Addám	Mínu	Matstsó
Flower	Sáru	Taraba	Sari	Puvvu*	Phúl
Foot	Vestámu	Aji	Adugésenánu	Medapán, Kéru	Khoju
Goat	Vodangá	Kime	Yimme	A'dú	Chheli
Hair	Tlámberakha	Avu	Jarli	Vondu, Mogurú	Kéms
Hand	Káju	Asi	Titti	Kayi, ki	Hát
Head	Tlávu	Abóbumv, Abumv	Bo	Vondu, Talayi	Múnd
Hog	Pajji	Kimbo	Gibbi	Pandri	Suvvar, Ghusiri
Horn	Kosko	Ajigna	Nirri	Kómmu*	Sing

† In Telugu káki.

‡ Telugu pagalu.

Horse	Godá	Kuḍata	Kirtyám	Kudara	Ghóḍó
House	Yiḍḍu	Súgna	Deyyón	Vúḍu	Ghór
Iron	Luharigá	Lómá	Vonchani	Yerunbu	Loho
Leaf	Aka	Olá	Vollá	Yale, Yaláku	Pát
Light	Vujwálá	Tambá	Taráḍutu	Valuku	Díp, Vujjait
Man	Lokká	Mandra	Lokko	Munasam	Mánús
Monkey	Kóju	Karóyi	Gusá	Kóte*	Mákaḍ
Moon	Layiḍi	Vongá	Arke	Tarra	Másu
Mother	Ayyá	Yo	Peṇamma	Táyi	Má
Mountain	Soru	Baru	Konḍá	Geṭṭu	Parvat
Mouth	Sùḍḍa	Amúká	Tummó	Váyi	Mú
Moschita	Vihángá	Abubbo	Kirigi	Yeyyi	Mussó
Name	Paḍḍá	Vonneman	Nenimmede	Andu	Ná
Night	..	Tógolo	Tungol	Ravu, Náváru	Ráyit
Oil	Níju	Miyyalo	Sól	Rganna, Vanna	Tél
Plantain	Táḍi	Kinte	Vusubullu	Nivále	Kodel, Sodail
River	Jóḍi	Náyi	Roggilu	Áru	Loḍḍi, Ladí
Road	Páhóri	Tangóra	Kungóru	Yegi	Bát
Salt	Vuppanga	Basi	Bitti	Sonava	Nún
Skin	Pándá	Wusál	Artá	Tálu	Chamaḍá
Sky	Mudengi	Agásá	Konḍá	Ménu	Sarg
Snake	Soráso	Ja	Buḍubu	Túna	Sáp
Star	Sukálá	Tute	Tsukka	Tsukka*	Bhuḍaká
Stone	Viḍḍi	Arregna	Birel	Kellu	Paththar
Sun	Belá	Vuyu	Singi	Proddu, Beruli*	Belá
Tiger	Króḍi	Kina	Yekkilí	Nálugádee	Bág
Tooth	Ahámu	Ajágna	Ginná	Pallam, Pelivelu	Dát
Tree	Mránu	Anébagna	Sunabbo	Cheḍe, Marom	Gáts
Village	Náju	Gorajáng, Ḍa	Yiugoma	Náḍu	Gá
Water	Sríḍrú	Dá	Deyyá	Tanni	Púni
Yam	Gánḍikúna	Gane	Ḍampu	Aluvele	Sarú, Sakarkanda
I	Anu	Gna	Naisá	Nánu	Hame, Hami

English.	*Kondh.*	*S'avara.*	*Gadaba.*	*Yerukala.*	*Chentsu.*
Thou	Yínu	Aman	Nó	Nínú	Tumyi, Tú, Yike
He	Yánju	Ani	Tulokku	Avanu	Vú, Vamhí
She	Toliyadu	Ani	Tulo	Avalu, Paiḍi	Mayyáta, Vú
It	Mónju	Ani	Tulo	Adu	Vahe, Vú
We	..	Móni	Neyam	Námu. Namburu	Hame
Ye	..	Aman	Pen	Níngalu, Avaru	Te, Tumyí
They	..	Ani	Mai	Tilá, Avállu [du	Vamhi
Mine	Nánde	Gránate	Noinyo	Nunguḍedi, Namburu-	Hamár
Thine	Mínde	Amannate	Nenne	Ningaḍeo, Ningaḍidi	Thór
His	Yevánetará	Ani-nate	Mayinó	Avanudu, Attamuḍidi	Vahár
Ours	..	Móni-nate	Niyyinó	Namburudu [du	Hamár
Yours	..	Aman-nate	..	Ningalide, Ninebuḍu-	Thór
Theirs	..	Ani-nate	Mayyinó	Avanudu	Vahár
One	Róndi	A'boy	Vokaṭi*	Vonḍu	Yék
Two	Jódeká	Bágu	Rendu*	Rendu	Duyi
Three	Tinigoṭá	Yági	Múḍu*	Múme	Tín
Four	Sári	Vonji	Nálugu*	Nálu	Chár
Five	Pánchu	Mollayi	Ayidu*	Anju	Pánch
Six	Só	Kudru	A'ru*	A'ru*	Chhé
Seven	Sáta	Gulji	Yéḍu*	Yégu, Vógu	Sát
Eight	A'ṭa	Tamuji	Yenimide*	Yettu, Vaṭṭu	A'th
Nine	Nogaṭṭá	Tinji	Tommidi*	Ombadu	Ló, Tóṭá
Ten	Dosó	Galiji	Padi*	Pattu, Pottu	Das
Twenty	Kóde	Bokoḍi	Yiruvai*	Yiravadu, Yirapottu	Bís, Panchgandá
Thirty	Tirisigoṭṭá	Bokoḍigaliji	Muppai*	Muppadu	Sátgandá doyícha
				[pottu	Pandrágaudá
Forty	Chalisigoṭṭá	Bágukoḍi	Nalabhai	Nalubadu, Náraraka-	Poun, Dasgandá
Fifty	Panchásó	Bágukoḍigaliji	Yábhai*	Anjarakapottu	Bárágandá doyícha
A hundred	Soḥó	Molloyikoḍi	Núru*	Pattu padulu, Potta-rakapottu	Panch Voḍi
Of	..	Ti	Móyi	Vakka	Vór

To	..	Ti	Nó	Ku*	Ku
From	..	Sitholo	Róm	Nunche*	Singa
By	..	Sitholo	Róm	Valla*	Soyi
With	..	Ruhá	Bonóm	Tóte*	Sang
Without	..	Yejja	Vuregusu	Yilladóte	Návunánai
In	..	Lógna	R	Kóre, Kóku	T, Gánt
On	Séndó	Lanka	Te	Paini*	Vuparóru, Vuparót
Now	Iddáli	Nami	A'	Yeppudu*	Yekhán, Yechini
Then	..	Namóde	Appudu	Appudu*	Tekhán, Areghodi
When	Yeseká	Yenga	Yindoyi	Yeppudu*	Kekhán, Kekkoneki
To-day	Nenju	Nangadini	Yinchá	I'mán	Ayije, A'jko
To-morrow	Rasi	Biyo	Beyyar	Nesú	Káyil
Yesterday	..	Amanni	Minde	Nesu Yennáyi	Káyil, Porusú
Here	..	Tenne	Tennó	Yatukire, Yinge	I'haná, Yechhini
There	..	Vodíte	Tonnó	Atukire, Ange	Unhaná, Vuha
Where	..	Téngá	Ammanó	Yite, Yenge	Kuhaná, Kahá
Above	..	Lanka	Tommá	Méne	Vupár, Vuparót
Below	Nede	Jáyitá	Alóm	Tallen	Tolót, Tól
Between	Madde	Lanka	Vomidi	Neduve	Mayidhít, Móyid
Without, Outside	..	Vodíte	Valumúsá	Bele	Bahar
Within	..	Alógna	Vomidi	Vulle	Bhitar
Far	Atumané	Sangayi	Sulóm	Túra, Kitte	Dúr
Near	..	Tuya	Tantel	Kitta, Kittáyi	Lág
Little	Yíke	Téte	Khandiki	Rútana	Ráj, Chone
Much	Púrá áte	Barí	Burre	Mettá	Bhórí
How much	Mesóni	Dite	Addisugó	Yittana	Ketta, Kettagulá
As	..	..	..	..	Lakha
So	..	Kanínásan	Vottu	Ate	Vú, Vumané
Thus	Yísingi	Yetténá	Vókke	Yite	Yí, Yemune
How	..	Yéngá	Yerándi	Yate	Kemune
Why	Annádeki	Jitásamgná	..	Yemmatuku, Phaláyá	Kissále
Yes	Vujje	Jádite, Ó' O'	Vóm	Ambó	Schchhá, Hoyyá

English.	*Kondh.*	*Savara.*	*Gadaba.*	*Yerukala.*	*Chentsu.*
No	..	Yajja	Vúre	Yillá	Nahí
(Do) not	Kunámá	Ṭiggo	Ayide	Mánu, Yikkara	Kámnai, Kámnahi
And, also	..	..	Tonnó	Num	Ke, Ye, Ye
Or	..	..	Vúre	Taradote	Nahi
This	..	Ani	..	Avanu	Vahare, Vu
That	Yerivi	Ani	Tónó	Adu	Vahe, Ke
Which	Yestánju	Vongá	Bhulóm	Yedu	Kahá
What	Anná	Vongáḍo	..	Yanna, Yemmatuku	Kí, Kocheher
Who	Yestánju, Yínu	Bote	Láyi	Yáru	Ke, Vuhe
Anything	Annátiki	Yetagání, Jitagání	Mádisá	Yemmadainá	Kíchu, Jehaive
Anybody	Yestánáte	Bote, Bótegání	Loyisá	Yeduayiná	Kevu, Jehaive
Eat	Tinumu*	Gába, Jombá	Sóm	Vunu, Kulla	Khá, Khayye
Drink	Punamu	Gába	Yídu	Kuḍi	Pí, Piyer
Sleep	Dohumu	Dímebá	Eyyá	Tuggudayi, Varngu	Súl, Sutiyár
Wake	Ningáḍahámu	Dímegó	Móḍukusudukká	Teligayirukku, Dinḍugunḍuyiru	Jágleró, Jágalerahó
Laugh	Kakkumu	Mágnába	Luḍḍó	Sirilá, Chiriko	Hás
Weep	..	Kam yite	Borryó	Agulá, Agu [yiru	Kánd, Kandiyár
Be silent	Kinni jáminnú	Kaḍangámá	Vayisodukka	Summa, Tsummate-	Ttsuperahó, Tsupparo
Speak	Katágehámu	Birdána	Sammeva	Vátésula, Vésetallá	Kathhákó, Kathhá
Come	Ninju	Jáyeba	Phinge	Vá, Várá	Asibo, Asili
Go	Nallákanju	Maba	Vóyináyare	Pó* [konḍuyiru	Jáyivi, Já
Stand up	Nistámu	Ḍeḍebá	Tune ná	Nikkebogu, Nindru-	Thá Dóho
Sit down	Kukkumu*	Góbá	Vaisá	Vukká, Vukkárinḍiri	Bos
Move, Walk	Kujinámu	Yírba	Vamsu	Naḍá	Tsó
Run	Gyáhamu	Naḍam	Dugga	Vóḍu	Bég
Give	Siyáninju	Tilisibba	Ċhedive	Tá, Vanko	Ne Diyo
Take	Kúvay	Yama	Ḍemá	Vákó, Vánkemáṭe	Niyyó, Niyá
Strike	Vetámu	Teda	Buvó	Mottu	Már, Maryó [leyó
Kill	Vesámáhudu	Kílisibba	Abboyo	Kolusu, Kollu	Marephelá, Moreva-

Bring	Támu	Pangayiba	Yindre	Yittikondu	Ane, Diyá
Take away	Aháne samallmu	Págná lá yírba	Sógusiyyá	Yittikondupó, Vákkondupómu	Nikejá, Niyá
Lift up, raise	Densumu	Lanka	Lenó	Yeḍuḍu	Tól
Hear	Venjámu	Anangá	Vóvo	Keru, Kéṭu	Sún
Understand	Anupunnenju	Anḍángalayi	Memyá avure	Telentsu	Málúm
Tell, relate	Vesámu	Appungá	Tsúnó	Sonnu	Ko
Good	Nekkánju	Ampase	Jalem	Nalla	Achháye, Bhálá
Bad	Nekkánju A'ye	Seḍéle	Nimmakávó	Keṭṭa, Keṭṭasu	Kharáb
Cold	Jilliminju	Soyi vuḍede	Tsallari	Musunu	Síttalá
Hot	Rumúrumam	Toggayi	Gechem	Vuḍuku*	Jóru, Tapta
Raw	Saḍáde	Amegna	Broluká	Pasuru	Kanchó, Káchoṭá
Ripe	Mránutangi sendijaninju	Agúrunate	Mágegisá, Bullo	Mágisu, Pandisu	Mugilá Pakká
Sweet	Sendijáninju	Mana	Sabbulká	Teyyanikkiri*	Mithá
Sour	Trahane	Aragna	Susoká	Pulladikkiri	Ammutó
Bitter	Pittáyine	Asa	Vusám	Ketstsu	Titto
Handsome	..	Ambasanate	Limmókká	Nalla	Bhalláti, Sundor
Ugly	Sonjabasdhe	Ambaste	Nimmokávórá	Nalladillá	Kharáb
Straight	Soddemanne	Barídakó	Lakoḍuttu	Sadunu	Sorichhaiyye, Sorikaráhache
Crooked	Bankaḍájúne	Kokkade	Dairoyi	Vankara*	Bankó
Black	Kálájáná	Je	Yide	Kaleḍe	Kallá, Kalíṭa
White	Sukkáre	Palu	Tatár	Valeḍá	Vujula, Savarniṭa
Red	Gérú	Soyipu	Beraiḍuttu	Yarraḍekirá	Goriya, Goriṇta
Green	..	Volámbidídakuvu	Vólempatstsa	Yalátstsággó	Harihjal, Sabuniya
Long	Lambájámu	Jelo	Tiyyár	Vasaram, Aragam	Vunchó, Namóṭá
Short	Koggári	Doyina	Dille	Kuratsa	Khaṭa
Tall man	..	Lanka	Tiyyár	Vasaram	Namó
Short man	..	Doyina	Poṭṭe	Ardullá [yan	Khaṭóṭi
Small	..	Sonna	Mengen	Chinnakerum, Siruvá-	Khopati
Great	Deranju	Gogo	Muḍó	Berudu	Badaká
Round	..	Gudi, Solágundu	Biregunḍu	Gundu*	Chatan, Goṭyaṭi

English.	*Kondh.*	*S'avara.*	*Gadaba.*	*Yerukala.*	*Chentsu.*
Square	Taṭṭu	Onjimûlalanka bagná, Sagnádaku	Duttu	Tsadaram*	Sadunúta, Chakkata
Flat	Rósarola	Samangaḍele	Sadunugáḍulta	Sadanu*	Chekunó, Chakkakini
Fat	Gellu ayininju	Kovvuḍéle	Bhirúgu	Kovvitsu, Nenamu	Telubhariya, Tellaraṭa
Thin	Banda ayininju	Palapalasan	Palasanadulta	Bakkadu	Saruvoti, Sakunaṭa
Weariness	Lahíte	..	Burre	Ayyósu	Haran, Vusiki
Thirst	Yesengepekmanenju	Araga	Yide	Dagga, Dappikonu	Pyaslagí, Pyas
Hunger	Chatanganki pannenju	Ḍolejan	Kuddu	Soda, Peruntsu	Bhúk, Bhoku

Note.—The words marked thus * are also Telugu words. Many of the vocables of the Yerukala people correspond with the Tamil words, representing the same objects; and many also of the Chentsu words resemble the Hindustani.

Notes on Alfred von Kremer's *edition of Wakidy's Campaigns.*— *By* A. Sprenger, M. D.

(First Notice).

In June, 1854, when at Alexandria, I had the pleasure of making the acquaintance of the distinguished orientalist, Alfred von Kremer. He showed me a very valuable copy of the campaigns of Wákidy. I induced him to edit it in the *Bibliotheca Indica* and recommended it to the Asiatic Society of Bengal. On my return to India in February, 1856, I had the pleasure of seeing it printed. Being probably better acquainted with the subject than any one else, and having several books which were not at the disposal of the learned editor, I undertake to write some remarks on the work. I beg, however, in the commencement to express the high sense which I entertain of Mr. Von Kremer's erudition and industry evinced in this, as well as, in his previous labours.

The Musalmans applied in early times the principles of judicial evidence to the historical criticism of traditions and showed an aversion against admitting written testimony alone, though sometimes they were obliged to acknowledge it, as we shall see lower down. In their opinion an account found in a book has no historical value, unless you have a witness who has been assured by the author himself that every part of the book is genuine or who has received this assurance from another witness who again may have received it from another up to the author. In olden times, it was usual to write the string of witnesses up to the author into every fasiculus of the book in three places: first on the title page, then in the commencement of the text and then again at the end. The form in which it is written is different in each of these three places. In writing the Arabic title page to Von Kremer's book, I restored and completed the original form from the editor's preface. In the last riwáyat I used the word "wijádatan." This is a technical term which is explained by *T*y by as follows: الوجادة من وجد بخط مولد و هو ان يقف على كتاب بخط شيخ فيه احاديث ليس له رواية ما فيها فله ان يقول وجدت او قرأت بخط فلان او في كتاب فلان بخطه Wijadáh is a newly coined word and derived

from the verb wajad "to find." It means that A. B. has got hold of a book containing hadythes in the handwriting of a Shaykh, but the contents of the book have not been verbally or by ijázah communicated to him. In this case A. B. must not say *akhbaraná* "I have been informed," but he must say "I have found," or "I have read in the hand-writing of C. D." or "in a book written in the hand writing of C. D."

In Iráqy's Alfyah, it is explained nearly in the same terms:

ثم الوجادة و ذلک مصدر * وجدته مولدا ليظهر
تغايرالمعني وذاک ان تجد * بخط من عاصرت او قبل
ما لم يحدثک به و لم يجز * فقل بخطه وجدت او احترز
ان لم يثق بالخط قل وجدت * عنه او اذکر قيل او ظننت

"The last [and least satisfactory mode of propagating *h*adythes] is the wijádah. This is a verbal noun from wajad "to find," it has been newly coined with a view of distinguishing this meaning from other meanings of this root [as wijdán which is used if it means "to feel" or wojúd "existence."] The term wijádah is used if you find *h*adythes in the handwriting of one of your contemporaries or a man of bye-gone days, whose lectures you have not heard and from whom you do not hold an ijázah. In this case you say "I have found in his hand-writing." But if you are not quite sure whether it is his hand-writing you must be on your guard, and you merely say "I found this *h*adyth from A. B." or you use the expressions "It is said" or "I believe."

Pages 1, 17, 43, 69, 95, 121, 149, 178, 206, 229, 255, 281, 306 and 357 of Kremer's text and p. 35 of Lees's Fotú*h* al-Shám contain specimens of the manner in which the string of authorities is stated in the commencement of every fasciculus. It is distinctly mentioned in the MS. of Fotú*h* that where the isnád stands commenced in the original, the second fasciculus.

A specimen of a Samá or the form in which it is written at the end of each fasciculus will be found lower down. As I have prepared for the press a work* on "the Canons of Historical criticism

* This work is a translation of the *Tyqryb wa Taysyr* of Nawawy illustrated with notes from Soyúty's commentary on it, from Nawawy's *Irshád*, Ibn Caláh's *'olúm alhadyth*, 'Iráqy's *Afyyah* and its two commentaries, from the dictionary of the technical terms used in traditions, from the *I'lám* of Qádhiy 'Iyádh (a very

of the Musalmans" which will contain a very full account of all these matters, I deem it loss of time to dwell here any further on this subject than to the extent it was necessary to make intelligible what follows.

Mr. Vou Kremer's copy is what I call an *authenticated* one. It was written by Más'úd b. 'Alyy for Abú-l-*H*asan 'Alyy Ibn al-*T*arrá*h*. In order to comply with the above condition—to have a witness that every part of the work is genuine, and to correct his copy, Ibn al-*T*arrá*h* read it in A. H. 532 before his Shaykh Ibn 'Abd al-Báqiy who compared what he read with his own copy. Subsequently, in 549, Mas'úd b. 'Alyy copied from the MS. of the Shaykh the Sama' into it. It was usual, for the Shaykh, if pupils read, to say in the commencement of each lecture, Akhbaraná fulán, i. e. "What thou art going to read, has been communicated to me and my fellow-students by A. B." Or the Shaykh remained silent and the pupil read Akhbarakum, i. e. "C. D. has communicated to thee and thy school-fellows what follows." This form is used here. Ibn 'Abd al-Báqiy had been instructed in the book by Jawhary. In this instance the book was read by a fellow-student of Ibn 'Abd al-Báqiy and he as well as the Shaykh (Jawhary) were listening.

The instructor of Jawhary, and his witness for the authenticity of the book was Ibn *H*ayyúyah a pupil of Ibn Aby *H*ayyah before whom his own copy was read by a student and he (Abú *H*ayyah) as well as Ibn Hayyúyah listened and he (Abú *H*ayyah) stated that it was really what he had heard from his teacher al-*H*árith Thaljy (died at the age of 76 in 206?) who had attended Wákidy's own lectures. Mr. Kremer gives us learned notices of some of these persons. It so happens that some of them are links in the chain of witnesses through which the Cawnpore copy of Ibu Sa'd was propagated to the celebrated biographer of Mo*h*ammad, *H*áfitz Dimyáty, the teacher of Hakkáry, by whom that copy was copied from Ibn *H*ayyúyah's text in 718. The isnád in the com-

rare work) from the تقييد العلم of the Khatyb Baghdády which treats on the introduction and progress of writing among the Moslims for the sake of preserving traditions, and throws a flood of light on the literary history of the first two centuries—and from a number of other works. My labour is nearly finished, but I left it among my books at Damascus, which have not yet reached me.

mencement of Ibn Sa'd runs : اخبرنا الشيخ الامام العالم الحافظ العلامة الذسابة شرف الدين ابو محمد عبد المومن بن خلف بن ابى الحسن الدمياطي رحمه الله قرأة عليه و انا اسمع قال انا الشيخ الامام محدث الشام ومسندة شمس الدين ابو الحجاج يوسف بن خليل بن عبد الله الدمشقي يقال انا (اخبركم read) ابو محمد عبد الله بن دهيل بن علي بن كارة انا القاضي ابو بكر بن محمد بن عبد الباقي بن محمد بن عبد اللة الانصاري انا ابو محمد الحسن بن علي بن محمد بن الحسن بن عبد الله الجوهري عن ابي عمر محمد بن العباس بن محمد بن زكريا بن يحيى بن معاذ بن حيوية الخزاز عن ابى الحسن احمد بن معروف بن بشر بن موسى الخشاب عن ابي محمد الحارث بن محمد بن ابي اسامة التيمي عن ابي عبد الله محمد بن سعد *

At the end of Ibn Sa'd we find several Samás which have been copied by Hakkary from more ancient MSS. A Samá is like a college certificate: its object is to record the names of those persons who were authorized to propagate the work or part into which it is written, and the names of the witnesses upon whose testimony their authority rests. I insert here the first of these Samás because I have never yet found either a Moslim or Christian who could make head or tail of this description of documents. Yet they are not without interest, and if we understand one, we can make them out all.

شاهدت بخط شيخنا الامام الحافظ ابي محمد عبد المومن الدمياطي رحمه الله تعالى يقول صورة سماع الجزء الثاني من اجزا ابن حيويه الخزاز [قرأ] على ابن حيويه الحسنُ و الحسين ابنا علي بن محمد الجوهري بغير تاريخ و سمعه من ابى محمد الحسن الجوهري جماعةٌ بقرأة ابى بكر الخطيب لبعضه و بعضه بقراة عبد الله بن سبعون القراوني ابو بكر محمد بن عبد الباقي بن محمد البزاز فى ربيع الاول سنة ٤٦٨ و سمعه منه بقرأة الخطيب ابو طالب عبد القادر بن محمد بن عبد القادر بن يوسف و ابو محمد الحسن و ابوالحسن على ابنا عبد الملك بن محمد [بن] يوسف و ابو ظاهر عبد الرحمن بن احمد بن عبد القادر بن محمد بن يوسف و محمد بن عبد الباقي الدوري و احمد بن ثابت غلام بن الشعري في ربيع الاخر ٤٦٧ سمعه من القاضي ابي بكر محمد بن عبد الغفار بسماعه من الجوهري بقرأة ابي المعالي مبارك بن هبة الله بن سليمان (سلمن) بن الصباغ ابو الحسن [عبد الله بن] دهيل بن على بن كارة و ولده عبد الله و ابو ياسر [بن] عبد الوهاب [بن هبة الله بن عبد الوهاب] بن ابى حية و [ابو الفرج] عبد الرحمن بن على بن محمد بن الجوزي الواعظ و ابو ماهر يحيى بن مقبل بن الصدر فى ثامن من جمادي الاخرة سنة ٥٢٩ و [سمعه] بقرأة عبد الكريم بن محمد السمعاني مسعود بن علي بن عبد

الله بن احمد الصفار في صفر سنة ٥٣٥ و سمعه من ابي محمد عبد الله بن كارة بقرأة ابي طالب عبد المحسن بن ابى العميد بن خالد (عبد الغفار) الحنفي الابهري و ولده [ابو] عبد الله الحصين (الحسين) و ابو الحسن [محمد بن علي بن الحسن (الحسين)] بن يوسف الهمداني و ولده ابو عبد الله (ابو الفتح) محمد و ابو محمد يوسف بن ابي جعفر السرقي الدياس و يوسف بن خليل بن عبد الله الدمشقي في جمادي الاولى (ربيع الاول) سنة ٥٨٩ وسمعه [من] ابن كارة بقرأة محمد بن ابي بكر بن ابي السعادات بن الراس جماعة منهم ابو الحسن بن محمد بن يحيى بن حكيم البغدادي و اخرون في ربيع الاول سنة ٥٧٩ و سمعه من ابن كارة محمد بن عبد الله بن احمد بن قدامة و ابن احمد بن عبد الله و احمد بن عبد الدار بن نعمة المقدسيون و عبد الرشيد بن محمد بن علي بن احمد المستدي بقراته في جمادي الاولى سنة ٥٩٥ فعلته حرفا بحرف كما شاهدته كتبه احمد الهكاري *

To understand the above, it is necessary that the reader should know that the standard copy of Ibn Sa'd—that written by Ibn *H*ayyúyah,* was divided into eight parts, and that at the end of every part, the teachers and pupils who read it, wrote their samá.' Hakkáry transcribed the more important Samá's into his copy and attached to every one his signature. This is the technical meaning of كتبه if it stands at the end of a document. We also find at the end of some documents العبد before the name of a witness, and this word is therefore also used for "witness" or "signature."

The samá' quoted above was written in the hand of the celebrated *H*áfitz Dimyáṭy, and it referred to the second part of the original. It appears from it that that part was read alternately by al-*H*asan al-Jawhary, mentioned above, and his brother al-*H*osayn (and as we learn from other samá's also all other parts of the book were read by them) before Ibn *H*ayyúyah. Subsequently in 447 the book was read before *H*asan Jawhary by the Khaṭyb Abú Bakr in the presence of six pupils, none of whom is of any interest, and in 448 it was read under his (Jawhary's) superintendence partly by the same Khaṭyb Abú Bakr and partly by 'Abd Allah Qarawany, and it was on this occasion that Ibn 'Abd al-Báqiy Bazzáz who has been mentioned above was present. Under the superintendence of Ibn 'Abd al-Báqiy [Bazzáz] who taught the book in the version of Jawhary, it

* هو بالفتح الحاء المهملة ثم مثناة تحت مضمومة مشددة و بعد الواو مثناة تحت مفتوحة ثم الها Núr alnibrás, p. 1988.

was also twice read, once in 529 by Ibn Hibat Allah and among the auditory were Dahyal and the celebrated 'Abd al-Ra*h*máu Ibn Jawzy and it was again read before the old man in 535 by Sam'ány. I must here observe that reading a book before a Shaykh for the sake of the isnád was a mere boast and ceremony, and therefore, students flocked to a man who had heard it a long while ago, however infirm he might be, from all parts of the Mohammadan world, in order that there might be few links between themselves and the author. This explains how it came that the old man lectured on a work which he had studied 87 years previously.

The rest of the above document offers neither any difficulty nor much interest and I therefore, confine my explanations to these few remarks.

From another Samá' we learn that Ibn *H*ayyúyah lectured on the book in 318 and again in 320 in his own house. It farther appears from one of the Samá's and from the isnád of Ibn Sayyid alnás that the Qádhiy Abú Bakr [Ibn 'Abd al-Báqiy] had two riwáyats of the text of Ibn *H*ayyúyah, that of Jawhary—and this riwáyat he transmitted to Abú 'Abd Allah b. Dahyal and others—and the riwáyat of Abú Is*h*áq Ibráhym b. 'Omar Barmaky, equally a pupil of Ibn *H*ayyúyah, which he had received by ijázah only. This explains why it is distinctly added above الجوهري عن بسماعه i. e. "Ibn 'Abd al-Báqiy taught the book as he had heard it from Jawhary." It is also stated that Ibn *H*ayyúyah mentioned before every *h*adyth his isnád up to the author. In referring to Kremer's text of Wákidy, we find that he did the same in teaching that book and that this objectionable practice was also adopted by his pupil Jawhary. Every isnád therefore, begins with "I heard from Mo*h*ammad [Ibn *H*ayyúyah] who had it from 'Abd al-Wahháb, from Mo*h*ammad [Thaljy]. This may perhaps justify the supposition that the standard copy upon which Kremer's text is founded, was that of Jawhary. Perhaps we may go farther and suppose that the omissions, and additions to be noticed lower down have been made by him. His giving the full isnád for every single *h*adyth seems to me to indicate that he did not yet consider the work as a whole but as an aggregate of documents of which he considered himself at liberty to take as many as he pleased or suited his purpose.

It is curious that Ibn Sayyid alnás, the author of the *'Oyún alathar* has used a copy of Ibn Sa'd and quotes a riwáyat for it nearly identical with the Cawnpore codex. He says:

و ما كان فيه عن محمد بن سعد فمن كتاب الطبقات الكبير له وقد قرأت معظم هذ الكتاب على الشيخ الامام بهاء الدين ابي محمد عبد المحسن ابن الصاحب محي الدين محمد بن احمد بن هبة الله بن ابى جَرَادَة العقيلي واجاز جميع ما يرويه و كان سمعه كاملا من الحافظ ابي الحجاج يوسف بن خليل بن عبد الله الدمشقى وذهبت يسير من اصل سماعه فلم تقيد عليه حين قراتي اياه عليه قال ابن خليل اثنا ابومحمد عبد الله بن ذهيل بن على بن منصور بن ابراهيم بن كارة سماعا عليه ببغداذ قال انا القاضي ابو بكر محمد بن عبد الباقى بن محمد بن عبد الله الانصارى عن ابى محمد الحسن بن على الجوهرى قال انا ابو عمر محمد بن العباس بن زكريا بن حيويه قال قرأ على ابو الحسن احمد بن معروف بن بشر بن موسى الخشاب و انا اسمع فى شعبان سنة ثمان عشرة و ثلثماية قال انا ابو محمد الحرث بن محمد بن ابى اسامة التميمى انا ابن سعد هذ الاسناد من اول الكتاب الى اخر ما فيه من خبر النبي صلى الله عليه والسلم *.

I may here add that it appears that Ibn Sayyid alnás had no copy of Wákidy, he had only Ibn Sa'd.

Having done with the isnád of Mr. Kremer's copy, let us proceed to the authorities whom Wákidy quotes, but in order more fully to illustrate the subject, I may be allowed to say a few words on Ibn Sa'd's authorities.

It is the praiseworthy habit of Ibn Sa'd to trace the testimony for every fact he states up to an eye-witness, but he deviates from this rule in his chapter on "the campaigns." Here he quotes at the head (folio 98) the four leading works on the subject. The statements contained in these four books, he works up according to the best of his own judgment,* without referring to them in the details. But where he supplies statements from other authorities, as he does sometimes, he gives the Isnád. These four works are 1. The campaigns of Wáqidy which he received immediately from the author. 2. The work of Ibn Is*h*áq which he took on the testimony of Rowaym b. Yazyd Moqriy who had it on the testimony of Hárún b. Aby 'Ysà and Ibn Aby 'Ysà was a pupil of Ibn Is*h*áq himself. 3. The work of Abú Ma'shar [Nojay*h* b. Abd al-Ra*h*mán d. 175] which he took on the testimony of al-*H*osayn b. Mo*h*ammad

* The technical term for such a process is دخل حديث بعضهم فى حديث بعض

a pupil of the author. 4. The work of Músà b. 'Oqbah [a client of the Zobayr family, d. 141]* which he took on the testimony of Isma'yl b. 'Abd Allah b. Oways Madany who had it from a nephew of the author, Isma'yl b. Ibráhym b. 'Oqbah and he had it from the author himself. I insert here Ibn S'ad's own words:

اخبرنا محمد بن عمر بن واقد الاسلمى اخبرنا عمر بن عثمان بن عبد الرحمن بن سعيد بن يربوع المخزومى و موسى بن محمد بن ابراهيم بن الحرث التيمى و محمد بن عبد الله ابن مسلم ابن اخى الزهرى و موسى بن يعقوب بن عبد الله بن وهب بن زمعة بن الاسود و عبد الله بن جعفر بن عبد الرحمن بن المسور بن مخرمة الزهرى و يحيى بن عبد الله بن ابى قتادة الانصارى و ربيعة بن عثمان بن عبد الله بن الهدير التيمى و ابراهيم بن اسمعيل بن ابى حبيبة الاشهلى و عبد الحميد بن جعفر الحكمى و عبد الرحمن بن ابى الزناد و محمد بن صالح التمار قال محمد بن سعد و اخبرنى رويم بن يزيد المقرى اخبرنا هارون بن ابى عيسى عن محمد بن اسحق و اخبرنى حسين بن محمد عن ابى معشر و اخبرنا اسمعيل بن عبد الله بن ابى اويس المدنى عن اسمعيل بن ابراهيم ابن عقبة عن عمه موسى بن عقبة دخل حديث بعضهم فى حديث بعض *

In reading over this passage of Ibn Sa'd, we should hardly suspect that he refers to books, and if we did not know from other sources that these four men to whom he refers had written down their statements, we might suppose that he received from them merely oral traditions.

Wákidy like Ibn Sa'd does not give the isnád for every fact, but he mentions in the first page twenty-six Shaykhs on whose testimony he had received the statements which he worked into one continuous narrative. Among them occur Abú Ma'shar and Isma'yl b. Ibráhym Ibn 'Oqbah, of these two we know distinctly that they taught complete, original works on the campaigns of the prophet, and it may be asserted with certainty of the remaining twenty-four Shaykhs that they were teaching books or collectanea, because the method in which in those days traditions were taught was, that one of the pupils read and the Shaykh listened to his reading and made the necessary corrections. The remaining pupils in some instances wrote down what he read, and hence the term

* See my remarks on these two works in an article in the Journal of the Asiatic Society of Bengal, Vol. 20. "On the earliest biographies of Mohammad."

كتبت الحديث من فلان which means generally, "I have taken traditions on his authority." Or they were also provided with copies and compared them with what he read. It is, however, impossible to say how many of these twenty-four Shaykhs lectured on systematic works on the biography of the prophet, and how many taught Masnads and Moçannafs, i. e. miscellaneous collections of traditions. I hope in a future article to be able to give a somewhat fuller account on the authorities regarding the biography of Mo*h*ammad which were extant at the time of Wákidy and of some of the Shaykhs of this writer, than at present, and I therefore refrain from entering here on this subject.

Now I come at length to the text of Wákidy. He begins with a list of all the campaigns and assassinations in which Mo*h*ammad was the leader, or which were undertaken by his orders. This list is followed by detailed accounts of each, but in the detailed accounts very little notice is taken of the expedition of *H*amzah, which took place in March 623, that of 'Obaydah which took place in April of the same year, that of Sa'd b. Aby Waqqâç, May, 623, that of Mo*h*ammad to Abwá, in August, that to Bowá*t* in September and the pursuit of Kurz. This omission is not due to Wákidy but to one of the ráwies—probably Jawhary. At the time of *T*abary, other more complete texts were extant, but he does unfortunately not say by whom. Every *h*adyth was originally considered as a whole in itself. Consequently early ráwies (persons who transmitted a book or *h*adyth) did not think it admissible to *alter* a *h*adyth or to omit *part* of it. But from a collection of *H*adythes, they considered it allowable to omit as many as they pleased without incurring any censure, and they might insert new ones, faithfully quoting their authorities. Again, where the author of the collection states his view on the subject, the Ráwiy might suppress it and give his own. This liberty has not only been taken with Wákidy but to a very great extent with the Muä*tt*á, and to some extent even with Bokhâry, where the fullest and the most defective riwáyat (editions) vary in the number of *h*adythes by more than two hundred. Fortunately this habit came early out of fashion, but not sufficiently early to preserve for us the text of Wákidy in its integrity.

I insert here a passage from *T*abary from which it appears that the Ráwiys did make slight omissions:

قال ابو جعفر زعم الواقدي ان رسول الله عقد في هذه السنه ... لحمزة لوا ابيض ... و ان رسول الله عقد ايضا في هذه السنة على راس ثمانية اشهر في شوال لعبيدة بن الحارث بن المطلب بن عبد مناف لوا ابيض و امره بالسير الى بطن رابغ و ان اللوا كان مع مسطح بن اثاثة فبلغ ثنيه المرة و هي بناحية الجحفة في ستين من المهاجرين ليس فيهم انصاري و انهم التقوهم المشركون على ماء يقال له احيا و كان بينهم الرمي دون المسايفة وقد اختلفوا في امير السرية و قال بعضهم كان ابو سفيان بن حرب و قال بعضهم كان مكرز بن حفص قال ابو جعفر قال الواقدي و رايت الثبت على ابى سفيان بن حرب كان في مايتين من المشركين *

"*T*abary observes: Wákidy fancies that the Messenger of God appointed in this year, *H*amzah, leader of an expedition and tied a white flag to his spear, and that the Messenger of God tied also, in Shawwál, in the eighth month after the flight, a white flag to a spear for 'Obaydah and sent him to Ba*t*n Rábigh. This standard was borne by Mista*h*. The expedition consisted of sixty refugees and no Ançáry, and it proceeded as far as al-Morrah in the neighbourhood of al-Jo*h*fah. They met the enemy at A*h*ya and there were some arrows exchanged, but it did not come to close combat with the sword. The accounts do not agree as to the leader of the caravan. Some say, it was Abú Sofyán and some say, Mikraz. *T*abary says: the words of Wákidy are "I consider it as settled that Abú Sofyán was the leader and that the caravan was defended by two hundred men." It is true, *T*abary gives at first merely an abstract of Wákidy's statements, but Arabic authors always preserve the words of the original and at the end *T*abary quotes Wákidy's own words. In referring to Kremer's text, we find that neither these words are in it, nor is the rest of the story so full. There are other quotations in *T*abary, which are not found complete in Kremer's original. In another place we find Ibn 'Oqbah quoted, and the manner in which it is done, leads us to suspect that this quotation is one of the many additions of a ráwiy to Wákidy's text.

The first affair regarding which Wákidy enters into very valuable details is the expedition of Ibn Ja*h*sh. This infamous exploit throws much light on the character of Mo*h*ammad and I therefore, give here an account of it. If the reader pays attention to the authorities

which I quote, he will observe how useful Wákidy is for tracing the history of that period.

Most of the refugees had neither friends at Madynah nor any means of subsistance. The number of men—exclusive of women and children—who were destitute is calculated at four hundred.* However great the charity of those of their brethren might be who were in easier circumstances, it must have been altogether insufficient to relieve their sufferings. The mosque which the prophet had built was filled with men who were houseless. Here they slept at night and sought shelter during the day against the scorching rays of the sun. This mosque, it appears, consisted of a low terrace, walled in on three sides, open on the fourth towards the court-yard and provided with a roof. Such a building is called *S*offah† and

* "The persons alluded to are the poor people among the refugees who amounted to about four hundred men. They had neither dwellings nor friends in Madynah. They employed themselves in studying the Korân in the mosque and in picking date-stones. They were ready to proceed on any expedition the prophet might send them on. These are the men of the Soffah." (Baghawy Commr. Kor. 2, 274.)

The mosque would not have afforded shelter to four hundred men and during the first and second year after the flight, the total number of refugees did not much exceed that number, and subsequently when they were successful in war the number of destitute Moslims was much diminished by death in battle and by the acquisition of booty. Ibn Sa'd folio 49 has two traditions, one of Abú Horayrah who was himself one of the men of the Soffah and one of Mo*h*ammad h. Ka'h, according to both the number of men who lived in the mosque amounted only to thirty. According to a tradition of Ahú Horayrah in Bokhára, they amounted to seventy. But these traditions refer to a very late period, for Abú Horayrah states what he saw and experienced himself, and he embraced the Islám very late. I therefore suppose that four hundred or less was the number of all the destitute Moslims, and that about one-fourth of them say seventy, who were more miserable than the rest lived in the mosque. The latter alone can properly be called the men of the Soffah, but at a later period it was apparently applied to all destitute refugees. Daily changes must have taken place, some leaving the Soffah and others taking their place, and therefore an attempt at too great precision would be a sure road to error.

† This is the meaning which the word has in Ibn al-Banná and which it retains up to this day in Mas*k*at. Such a place is now called Lywán, at Damascus whilst the word çoffah has quite a different meaning in Syria and Egypt, on which see Kremer's Mittelsyrien and Lane's Modern Egyptians. Yet I have been assured at Damascus that a Lywán with a flat roof may be called a Soffah.

hence these men who were apparently more wretched than the rest, are known as the men of *Soffah*. They offered a miserable spectacle, many of them had no other clothing at day nor any other covering for the night, than a rag tied round the waist.* On one occasion 'Aly got a curtain as his share of the booty and he made a present of it to these men. The prophet took it and cut out aprons for as many as it yielded. Some had rags tied round their neck which came down to their thighs and they were so transparent that they were obliged in walking to hold them together in front with their hands to cover their nakedness.† They were also very unclean: Their rags swarmed with vermin and they exhaled a most offensive smell.‡ At supper time the prophet would invite some of them to partake of his own meal and the rest he distributed over the houses of his wealthier followers, whom he exhorted in the *Korân* to be charitable towards them.§ Yet notwithstanding these efforts they suffered so much of hunger, even towards the end of the prophet's earthly career, in the days of prosperity of the Moslim community, that Abú Horayrah relates that he fainted from starvation.‖ Immediately after the Hijrah their wretchedness must have been much greater.

The only outlet for these desperate men was bloodshed and robbery. The Messenger of God waylaid every Qorayshite caravan that went to the north. But in vain. They were in so great number and their precautions were so complete that, during the first sixteen months, all his efforts proved abortive. On the contrary, Kurz suc-

* Ibn Sa'd, folio 49, and Bokhâry.

† *Majma' albahrayn, sub voce sff.*

‡ *Ta'arruf* and the commentary thereon, a work on Sufism, p. 8, I have, however, only the Persian translation.

§ "Whatever charity you spend, give to those poor men who have been disabled for the sake of the cause of God, they cannot go about in the world, ignorant persons consider them rich on account of their modesty, but you may recognize them by their appearance. They do not beg with importunity," 2, 274. Most commentators of the *Korân* and Ibn Sa'd fol. 49 maintain that this verse refers to the men of the *Soffah*. If so, it was revealed very late, when only men who were not fit for war were poor.

‖ Baghawy, *loco cit.*

ceeded in carrying away the flocks of the inhabitants of Madynah. The failure of Mo*h*ammad, and the success of his enemies must have made a very unfavorable impression on the population of Madynah, on the friends as well as the enemies of the Islám. Being driven to extremities, he planned immediately on his return from the chace of Kurz, towards the end of December, 623, a most desperate expedition.

It consisted of twelve men* who were mounted on half that number of dromedaries, two men riding one animal in turn. He first offered the command over the party to Abú 'Obaydah,† and as he refused to accept it, he appointed his own cousin 'Abd Allah b. Ja*h*sh to it, whom he had employed on a similar occasion the preceding year, and he conferred upon him, as long as the expedition lasted, the title of Amyr Almuminyn "Leader of the Faithful" which was subsequently assumed by the Khalifs. He did not communicate to him the plan of the expedition, but gave him sealed orders with

* Ibn Sa'd p. 99 and Wákidy *apud Tábary*. Ibn Is*h*ák says that there were only eight men, and he gives their names, viz.:

1. Abú *H*odzayfah [Mohashshim or Háshim or Hoshaym or *K*ays] b. 'Otbah b. Raby'ah b. 'Abd Shams. 2. 'Okkáshah b. Mi*h*san b. *H*orthán, an ally of the banú Asad b. Khozaymah. 3. 'Otbah b. Ghazwán b. Jábir, an ally of the family of Nawfal b. 'Abd Manáf. 4. Sa'd b. Aby Wa*k*kás of the Zohrah family. 5. 'Á*m*ir b. Raby'ah of the 'Anz b. Wáyil tribe (i. e. an Anezah) and an ally of the family of 'Ady b. Ka'b. 6. Wá*k*id b. 'Abd Allah b. 'Abd Manáf b. 'Aryn b. Tha'labah b. Yarbú' of the Tamym tribe, an ally of the 'Ady family and more especially of 'Omar. 7. Khálid b. al-Bokayr of the banú Sa'd b. Layth equally an ally of the 'Ady family. 8. Sohayl b. Baydhá or according to others his brother Safwán b. Baydhá of the banú al-*H*árith b. Fihr. From Ibn Sa'd we also glean the name of al-Midád b. 'Amr, who seized al-*H*akam b. Kaysán and made him a prisoner. And Sodyy apud *T*ábary p. 238 mentions also 'Ammár b. Yásir and 'Á*m*ir b. Fohayrah. This name, however, may be a mistake for 'Á*m*ir b. Raby'ah. In Ibn 'Okbah *apud* Ibn Sayyid alnás is 'Á*m*ir b. Ayás.

† "The prophet dispatched a small party of men under the command of Abú 'Obaydah b- al-Jarrá*h*. When Abú 'Obaydah took leave, his affection to the prophet overcame him and he shed tears. Mo*h*ammad therefore, appointed another person whose name is 'Abd Allah b. Ja*h*sh Azdy" (Mo'tamir *apud Tábary*, p. 240). Wákidy, p. 7, relates the same story, but he says that the name of the person to whom the command had been offered, was 'Obaydah b. al-*H*árith b. al-Mo*tt*alib.

directions to open them, after he had proceeded two days' journey on the upper Makkah road, on which, the Moslims had several times waylaid the *K*orayshites. He also told him that when he had read the orders to the men under his command, he was to make them distinctly understand that every one of them was at liberty to proceed and assist him in carrying them out or to return to Madynah. On opening the letter 'Abd Allah found orders to proceed to *N*akhlah, which lies on the road from Makkah to al-*T*áyif and Yáman, and to watch the movements of the Korayshites in that quarter.*

'Abd Allah declared that he would obey the orders of the prophet and ten of his men were of the same mind, but two went to Ba*h*rán† and after a considerable stay there they returned to Madynah, where they arrived after their victorious companions.‡

* According to Ibn Is*h*a*k* they were conceived in the following terms: "When you have read this my letter proceed as far as Nakhlah, between Makkah and al-*T*áyif, watch the movements of the *K*orayshites and give me information thereof." In Wákidy p. 8 the letter runs: "Go to Nakhlah in the name of God and with his blessing. Do not force any one of the men to accompany you, but proceed and carry out my orders with those who choose to follow you. When arrived at Nakhlah, watch the caravans of the *K*orayshites." Another version is in Baghawy Comm. Kor. 2, 214. I do not consider any of these versions as genuine.

According to Sodyy he was to open the orders at Malal which is on the road from Madynah to Makkah, twenty-one or eighteen miles from the former city.

† Ba*h*rán or Bo*h*rán is in the neighbourhood of Ma'dan Bany Solaym (Ibn Sa'd). It is not far from al-For' *(Nihâyat al-Jazary)*. In the territory of the Solaym tribe (Wákidy p. 8.)

‡ Ibn 'O*k*bah *apud* Ibn Sayyid alnás; Wákidy p. 8; Sodyy and Mo'tamir *apud T*abary pp. 239 and 240. The names of these two men are Sa'd b. Aby Wa*kk*ás and 'Otbah b. Ghazwán. Ibn Is*h*á*k* and most authors after him, including Ibn Sa'd deny that they refused to proceed. He says: "The whole party proceeded as far as a ma'dan which is above For' and has the name of Ba*h*rán, there the camel which Sa'd and 'Otbah b. Ghazwán were riding went astray, and whilst they went in search of it, the rest of the party proceeded." It appears from Wá*k*idy p. 9, that this story has been preserved by the family of Sa'd b. Aby Wa*kk*ás and probably invented by them. The father of Wákidy's teacher had received it from the son of Sa'd b. Aby Wa*kk*ás. The isnád in Kremer's edition is defective and ought to run "Wákidy from Abú Bakr b. Isma'yl b. Mo*h*ammad from his father, from 'Á*s*im b. Sa'd b. Aby Wa*kk*ás from his father."

When 'Abd Allah with his ten followers had arrived at Nakhlah* he observed in the afternoon of the 28th of December, 623, a party of four *K*orayshite merchants. Their camels were laden with leather, raisins and wine, and they were on their way from al-*T*áyif to Makkah. They were frightened at the appearance of the stragglers, whose sinister purpose must have been pretty clear from their light mode of travelling. To remove suspicion from their minds, one of them, 'Okkáshah, had his head shaved, in order to look like a pilgrim. The stratagem succeeded, the more because the new moon over the western horizon assured the merchants that the sacred month of Rajab had commenced, which was respected by the most abandoned robbers, and in which the traveller might fearlessly go on his way. They unloaded their camels and sent them over the plains to browse and sat down to cook their dinner. When they were completely off their guard, Wákid took advantage of the opportunity, shot an arrow into them which killed the leading man among them. They now made a rush upon the remaining three men and made two of them prisoners, but the third being mounted on a swift mare effected his escape, and reached Makkah the next morning.† The followers

* "Nakhlah is identical with the Bostán Ibn 'Ámir which is near Makkah" (Ibn Sa'd p. 99). "Bostán Ibn 'Ámir is a corruption for Bostán Ma'mar (Ibn Mo'ammar ?)" (Ibn *K*otaybah, *Adab al-kátib*). The full name of Mo'ammar from whom the place has its name is Mo'ammar b. 'Obayd Allah b. Mo'ammar b. 'Othmán b. 'Amr b. Ka'b b. Sa'd b. Tamym b. Morrah b. Ka'b b. Lowayy. Some however, say it has its name from *H*adhramy Ibn 'Ámir, and some say from 'Abd Allah b. 'Ámir b. Korayz, so that etymology gives us no clue to its history. Baṭalyúsy in his commentary to Ibn *K*otaybah maintains that the Bostán Ibn 'Ámir and the Bostán Ibn Mo'ammar are not identical, but he allows that the latter is identical with Baṭn Nakhlah [Yáqút, *Mu'jam*, *voce Bostán*]. The same author (Yákút) says under Nakhláh that two valleys meet at Bostán Ibn 'Ámir, one of which comes from *K*arn almanázil and is called Nakhlah Yamanyyah i. e. Southern Nakhlah). Along this valley runs the road to Yaman. The other comes from al-Komayr and is called Nakhlah Shámyyah or Northern Nakhlah. It is important to observe that these two valleys belong to the Hodzayl tribe, and are two days journey from Makkah. Bostán 'Ámir is situated in Baṭn Marr and Sabú*h*ah.

† The name of the man who was killed is 'Amr b. al-*H*adhramy ['Abd Allah] b. 'Abbád ('Imád or 'Ayyádz) of the Kindah tribe. He had three brothers, one of them al-'Alâ turned a Moslim. He had also a sister, *S*a'bah who embraced

of the prophet took the prisoners and goods and returned with them victoriously to Madynah.

There occur two verses in the *K*orân which, according to the testimony of most authorities, bear on this expedition. They run:

"They ask you regarding the sacred month [of Rajab], as concerns fighting in it. Answer: Fighting in it is a serious matter, but to obstruct the path (the religion) of God, to disbelieve in Him and his sacred temple (the Ka'bah) and to expel its votaries (the Moslims) from it, is a much more serious matter in the sight of God. Farther, persecution is a more serious matter than killing a man. They will never cease to make war against you, O Moslims, until they turn you from your religion, if they be able; but the works of those among you who apostatise from their religion and die as infidels, shall be vain in this world and in the next, and their reward shall be the fire, in which they remain for all eternity."

"Certainly those who believed and those who emigrated and fought in the path of God, may hope for the mercy of God, for God is forgiving and merciful."—(2, 214 and 215).

Mo*h*ammad admits without reserve that his disciples have violated the sacred month. His biographers do not exactly deny the fact, but they give explanations which afford interesting specimens of the manner in which they disguise facts discreditable to the Islám.*

the Islám and is the mother of *T*alh*a*h b. 'Obayd Allah. The men whom they took prisoners are: 'Othmán b. 'Ahd Allah h. al-Moghyrah Makhzúmy he was also captured at Badr and died an idolater; and al-*H*akam h. Kaysán a barber by profession. The man who escaped is Nawfal b. 'Abd Allah, a brother of 'Othmán.

* To understand what I have to say in this note, it is necessary to know that the following is the order of the Arabic months: Jumádà II. Rajab, Sha'hán. Of these three, only the Rajab is sacred. It is farther to be observed that the month begins about sunset from the moment the new moon is observed, or might be observed if it was not hidden in clouds. Ibn Is*h*á*k* says, "This being the last day of Rajab, they consulted among themselves whether to attack them or not. Some of them observed, If you do not attack them to-night they will slip into the sacred territory where it is unlawful to attack them. On the other hand if you attack them you violate the sacred month. They were long doubtful what to do, but at last they took courage and attacked them." If this version were true, the question would be, did the attack take place before or after sunset. From what he says lower down, it would appear that it took place after sunset, for he states that the Moslims at

The refusal of three of his stoutest adherents—'Obaydah, Sa'd b. Aby Wa*k*k*á*s and 'Otbah—to take part in the sacrilege, leads us to infer that it was committed by his orders.* This, however, he

Makkah maintained that the robbery was committed in Sha'bán.—Wákidy states that the attack took place on the last day of Júmadà, and most original authorities as Sodyy, Mo'tamir, &c. agree with him on this point though he contradicts himself in p. 2. In page 8 we read, 'The party said to the prophet, we attacked them at day time, in the evening we observed the new moon of Rajab. We therefore do not exactly know whether we attacked them in Rajab or on the last day of Jamádà.' Ibn Sa'd says simply, "They were not certain what date it was: and whether it was a day of the sacred month or not." Baghawy, in his zeal for the honor of the Islám has heen hetrayed into a strange mistake. He says that they made the attack on the last day of Júmádà II. because they did not like to postpone till the next day, for fear they might slip into the sacred territory.

* In the Moçannaf Ibn Ahy Shaybah, folio 346, occurs an important tradition which proves that Mo*h*ammad did not scruple even the preceding year to violate the sacred month: "When the prophet had come to Madynah the Johaynah paid him a visit and said, You have settled in our rear, let us conclude a treaty that we may have nothing to fear from you nor you from us. He concluded the treaty with them though they did not embrace the Islám. In [the sacred month of] Rajab, January, 623, the prophet sent us (the man who speaks is Sa'd h. Aby Waqqáç) on a predatory expedition against a tribe of the Banú Kinánah [who were in league with the Qorayshites] in the neighbourhood of the Johaynah. We attacked them, hut we were less than one hundred men strong, whereas they were very numerous. We therefore, retreated to the Johaynah. They said, We hope you did not fight in the sacred month. We answered We fight those in the sacred month who have expelled us from the sacred territory. Upon this [the objections of the Johaynah to protect persons who violated the sacred month] a discussion took place among us, some said, Let us go to the prophet to inform him of what has happened. Others insisted upon remaining and I [says Ibn Ahy Waqqaç] and some others proposed to attack a *K*orayshite caravan which was expected. We told them at the same time that if we made any booty only those would have a share in it who would take part in our expedition. We went to waylay the caravan whilst the others returned to the prophet to consult him regarding the sacredness of Rajab. When they came to him he was in a great rage and said, "You left me all united, and you return to me divided into parties. Division and party-spirit has hitherto ruined the Arahs. I will now send a man who shall command you. He surpasses all others in perseverance, and in hearing hunger and thirst. Upon this he appointed 'Ahd Allah b. Ja*h*sh as our chief, and he was the first Amyr in the Islám." I may add that Majady the Shaykh of the Johaynah did not allow them to attack the caravan. This indignation of the Johaynah explains why Mo*h*ammad

denied. When they came to Madynah, he said to them, I did not order you to fight in the sacred month, and he refused to accept the portion of the booty which 'Abd Allah had set aside for him, nor would he divide the booty and dispose of the prisoners. His orders were probably worded in such a manner, that complicity could not be distinctly proved against him. To share responsibility with a man in power is always dangerous. In case of failure he makes his tool the scape-goat.

Those men who professed to restore the religion of the Ka'bah to its purity, and who pretended to live for a higher object had violated one of the most sacred institutions. They had shed blood in one of the four months during which the Arabs sheathed their swords, and during which the merchant and traveller might without fear or molestation travel through the desert. Sohayly, vol. 3, f. 68, observes anent the sacred months:—

"The observance of the sacred months was a commandment of God which had been acted up to ever since the time of Abraham and Ishmael. It was one of the prohibitions which God ordained to promote the interests of the inhabitants of Makkah. He says in the Korân 5, 98. 'God has established the Ka'bah, that it be a stand-by for mankind [where they find safety and as a centre of the observances of the true religion]. With the same view he has ordained the holy months, sacrifices and offerings.' This is due to the prayer of Abraham who, when he caused some of his offspring to settle in an unfruitful valley, prayed to God that he might make the hearts of some men affected with kindness towards them. (Kor. 14, 40). The commandment of God, that all men should perform the pilgrimage to Makkah, greatly promotes the interests of its inhabitants and furnishes them with a livelihood. Besides establishing the Ka'bah, God ordained the four holy months. Three of them Dzú-l*k*a'dah, Dzú-l*h*ajj and Mo*h*arram are continuous and one of them the Rajab is isolated. The object of the three continuous

was so cautious in planning his expedition the next year: It started before the sacred month but could not reach its destination before new moon and from the equivocations of a written order, no reference could be made to him. It farther explains why the same Ibn Aby Waqqáç who had witnessed this indignation of the Johaynah tribe remained behind, and why 'Abd Allah b. Ja*h*sh was chosen as the leader.

months is to enable people to perform the annual general pilgrimage. One month precedes the month in which the pilgrimage is to be performed and one month follows it. The space of three months enables a man to come from the most distant parts of Arabia in safety and return again to his home. The object of rendering the month of Rajab sacred was to enable people to perform occasional individual visits to the Ka'bah. Half a month for going and half a month for returning was enough, for no one comes from a great distance for *this* ceremony. During the pilgrimage, Makkah was provided with supplies which were cut off during the remainder of the year by the Bedouins and robbers. In Rajab the traveller to and from Makkah was equally safe. God had ordered that it should be so in his care and foresight for the Makkians, and he caused this institution of the religion of Abraham to survive. It was not abolished until the Islám was introduced, and it was even kept up in the commencement of the Islám. But the revelation of the 'verse of the sword' made fighting lawful, yet it did not do away entirely with the sacredness of the holy months."

The popular feeling against the outrage was very strong, not only among the pagans, but also among the Moslims who were very harsh against the perpetrators,* and as it would appear from the above Korán verses some of whom threaten to relinquish the new faith.

Mo*h*ammad had himself been present at a war in which all the *H*oms tribes united to punish a much slighter violation of the ancient *H*aramite institutions. And therefore, being as yet weak he did not dare formally to abolish the sacred months though he took this step subsequently when he was stronger.† In the above quotation from the *K*orân he allows that this act of aggression was sinful but holds out a hope to the perpetrators of forgiveness‡ and

* Ibn Is*h*á*k*.

† The Jews predicted that this murder would lead to a long war, in a pun which they made on the names of *'Amr* b. al-*H*ydhramy and his murderer Wákid. It runs *'amirat alharb* "the war will last long;" *hadharat alharb* "the war has commenced" *wakadat alharb* "the war is flaming."

‡ Ibn Is*h*á*k* who follows the authority of Zohry and of Ibn Rúmán from 'Orwah takes great pains to give a different bearing to the second verse. "After the first

he contents himself by showing to the world that the wrongs which the *K*orayshites committed against him were much greater than those which he committed against them, and that they had taken the initiative, for it was their display of brute force during the sacred months which prevented him from visiting the Ka'bah agreeably to the Haramite institutions. And in order to put them entirely in the wrong he accused them of disbelief in the primitive religion of the holy temple for which he professed the highest veneration. And he now ordered the Moslims who had hitherto been in the habit of turning their faces in prayers towards Jerusalem like the Jews, to direct their prayers towards the Ka'bah.* In order fully to appease the popular feeling he was obliged to pay the price of the blood of Ibn al-*H*adhramy.† As to the manner in which he disposed of the booty and prisoners, there is a great variety of

verse had been revealed which absolved 'Abd Allah b. Ja*h*sh from guilt, they came to the prophet and said, that they would now expect some reward from God for their exploit, and upon this, the second verse was resolved, which, he conceived, contains a promise of farther reward."

* According to Ibn Is*h*á*k* the qiblah was altered in Sha'bán (February, 624) and consequently just when this affair was in agitation.

† "The prophet paid the price of the blood of Ibn al-*H*adhramy to his *K*orayshite heirs. Mojáhid and others say, he paid it, because there existed a truce of two years between the prophet and the *K*orayshites." (Baghawy Comm. on the *K*orân, 2, 214).

"The prophet paid the price of blood for 'Amr b. al-*H*adhramy, and he proclaimed that the sacred month is to be respected as it had been. It was subsequently that God made it lawful to fight in it." (Wákidy p. 10, from Ma'mar, from Zohry, from Orwah) but in page 11 is another tradition from Ibn Aby Sabrah in which Ibn 'abbás declares that the prophet did not pay the price of the blood, and Wákidy adds that he and his contemporaries considered this as the true version. I adhere to the view first expressed, because the authority of Zohry is stronger than that of Ibn 'Aby Sahrah, secondly, Ibn 'abbás was a liar, thirdly, as it places the prophet into an unfavorable light, if he had to pay the price of blood (by doing so, he acknowledged that his followers were murderers), it is more likely that the fact, if it happened, would be denied than that such a statement, if not true, was invented. Fifthly, Mojábid who is one of those men who, during the first century of the Hijrah put the Islám into shape, admits that he paid the price of blood; but states a reason which we know to be a lie, because not a month was allowed to elapse during the two years in which the Moslims did not waylay the *K*orayshites.

opinions. One author, but as far as I know only one,* states that the booty was returned to its owner, this I conceive to be true, because it is consistent with the payment of the blood-money. I also think that the prisoners received their liberty without payment.†

This daring robbery proved to the *K*orayshites that their caravans

* "Ibn Wahb mentions that the prophet returned the booty and paid the price of the blood of the man who was killed." (Núr alnibrás p. 719.) The other statements contradict each other. They run:

"During the time of paganism, it was usual that the leader of a successful expedition received one-fourth of the booty. When 'Abd Allah b. Ja*h*sh returned from Nakhlah he took only one-fifth of the booty and divided the rest among his men. This was the first case in the Islám that a leader took a fifth, subsequently the verse of the *K*orân 1, 42 was revealed." (Wákidy p. 10). "Some descendants of 'Abd Allah b. Ja*h*sh say that he divided the booty when it had been declared lawful. Four-fifths he gave to his men and one-fifth to God and his Messenger. What he did coincided precisely with what God subsequently commanded to be done." (Ibn Is*hák*, he allows at least that for some time Mo*h*ammad did not consider the booty as lawful). Ibn Sa'd, says 'Abd Allah, divided the booty on his arrival at Madynah without hesitation. And Ibn Sayyid alnás states that some authorities maintain that Mo*h*ammad divided the booty after the battle of Badr.

† Though Ibn Is*hák* states that they were ransomed, he admits that the prophet did not consider their detention lawful before the *K*orân verses quoted above were revealed for, until then, he would have nothing to say to the whole matter. He says: "When the verses of the *K*orân were revealed, the prophet took the booty and prisoners under his care. The *K*orayshites sent men to Madynah to ransom the two prisoners. The prophet said to them, I will not give them up before my two men Sa'd and 'Otbah have made their appearance. I fear you have killed them. If so, I put your two men to death. When Sa'd and 'Otbah had come back, he accepted the ransom for them. Al-*H*akam remained with the prophet and he was subsequently slain in the battle of Byr al-Ma'únah. 'Othmán returned to Makkah and died there in his former faith." Wákidy goes so far as to name even the amount at which they were ransomed, viz.: each of them for forty ounces of gold. One ounce is equal to forty dirhams. The account of Ibn Is*hák* contains a contradiction. He says that al-*H*akam was ransomed and also that he then and there embraced the Islám and remained at Madynah. His profession of the Islám would have secured him his liberty without ransom. In the Isábah we find the solution of the contradiction. 'Omar intended to put him to death (probably under the impression that Sa'd and 'Otbah had been killed) and to avert his execution he embraced the Islám. The story about the ramsom falls therefore to the ground.

were not safe in any place of the *Hijáz*, nor at any season of the year, and henceforth the want of safety, and the difficulties and expense of communication were so great that their commerce was ruined. If the object of Mo*h*ammad in planning this expedition had been to bring matters to a crisis, he obtained it, for two months after, the battle of Badr was fought, which decided the fate of the ancient institutions of Makkah. One of the greatest advantages which Mo*h*ammad had over his enemies, and one of the main causes of his success was, that he was perfectly free from the fetters which ancient habits imposed upon them. He could break through any law, through any custom, through any preconceived notion of honor, alleging a divine command to counterbalance public opinion. It is true in this instance he gave way; but when he grew stronger he neither sacrificed an advantage nor a passion to public opinion. If necessary he justified his acts by a revelation.

Literary and Miscellaneous Intelligence.

The January No. of the Journ. Asiatique for 1855 contains the conclusion of M. Defremery's paper on the history of the Assassins of Syria. The author is about to publish a detailed work on the Carmathians of Persia, and he will then enter into an examination of the religious dogmas of both these sects. M. Pavie also concludes his analysis of the Bhoj-prabundh.

The same periodical for February and March opens with a lexicon compiled by M. de Saucley in justification of his translation of the Behistan inscription published in a previous No. Then follows a notice of the principal porcelain manufactories in Japan by M. Hoffman with translation of an extract from a Japanese MS. in the Leyden library which describes the manufactures of Imari. M. Wöphe continues his 'Recherches' on the history of the Mathematical Sciences among the Arabs, and M. Victor Langlois gives a narrative of his Journey to Sis, the ancient capital of Armenia.

The April No. continues Wöphe's Mathematical paper. An analysis with extracts is here given of a Persian MS. of Abul Wafi in the Imperial Library. The only other original paper is by M.

Gustav Dugat on Hodba, an Arab poet of the 1st century for the Hegira. Among the 'Nouvelles et Mélanges,' always so interesting in this Journal, is a letter from M. Delaporte of the French Consulate at Mosal, in which we find the promise of a detailed history of that city, the key of Kurdistan. Another letter from Constantinople gives hope of an edition of Rashidoodeen's Jamuh-ool Towarikh, being shortly published at Constantinople.

The No. for May and June continues Sanguinetti's extracts from Ibn Aby Ossaibiúh's History of Physicians. The present extract gives particulars of ten physicians, one of them a woman, who lived before and contemporary with Mohammad, or during the reign of the Ommiade and early Abbasside Caliphs. The next article is by Pavie and entitled—'Some observations on the Serpent Myth of the Hindus.' Taking for his text a bas-relief in our Society's Museum, representing the king and queen of the Nagas, and another from Egypt representing under the form of serpents, Jupiter Serapis and Iseis Myrionymus, and which is figured by Guiguiault in his Religions de l'antiquité, the author points out several striking analogies between Indian myths and Western traditions, as well biblical as Greek and Egyptian. M. Cherbonneau abstracts from a MS. of Ibn Hammud some interesting information regarding Obeid Allah the founder of the Fatimite dynasty, and M. Belin with a few remarks on the system of instruction pursued in the Ottoman Colleges, gives the text and translation of an Idjayè or Professor's diploma, such as is in use in Turkey. The No. concludes with a notice by Reinaud of the new Catalogue of the Oriental MSS. of the Imperial Library of Paris now under preparation, and of which the 1st vol. is to appear next year.

The July No. of the same Journal is entirely occupied by Mohl's Annual Report which gives a full and most interesting resumé of the labours of oriental scholars during 1854-55.

The 3rd No. of the Zeitschrift of the German Oriental Society opens with Prof. Rödiger's report for 1854. Flügel notices certain peculiar methods of attaching dates to their works in the sixteenth century by copyists of Mohammedan MSS. Von Hammer continues his extracts from Saalchi. Prof. Pott of Halle follows with a philological paper, in which he points out where he differs from Max

Muller in his classification of the Turanian languages, as explained in the letter written by the latter for Bunsen's late work. Dr. Levy remarks on the Chaldaic inscriptions and vessels found by Layard, and Dr. Burgsh continues his Egyptian researches. The last original article consists of further materials for the history and Geography of Soodan contributed by the African traveller Dr. Barth and worked up by Mr. Ralfe.

No. 4 of the same Journal opens with a paper by Prof. Stenzler on Indian trial by ordeal. Hang continues his Zend researches. Prof. Stähelin and Dr. Hitzig complete the No. by contributions on subjects bearing for the most part on Hebrew History. Among the many interesting extracts from correspondence, which are published in this No. is a letter on the Chinese residents of Java, written by the young prince of Ashantee, who has been educated in Holland and Germany, and is now an Engineer in the Dutch service at Buitenzorg.

The 2nd and 3rd part of Vol III. of the 'Indische Studien' begins with an Index to the harmonies and discrepancies in Benfey's edition of the Sama Veda. Nearly all the other contributions to the No. are by the learned and industrious editors, and nearly all bear on the literature and philosophy of the Vedas. There is, however, a review of Wagener's Essay on the connexion between Indian and Greek fables and a translation by Spiegel, of a paper by Westergaard on Ancient Iranian Mythology.

The 1st No. of the 5th vol. of the Journal of the American Oriental Society is entirely occupied by the Rev. Mr. Stoddard's Grammar of the Modern Syriac language as spoken in Oooroomiah, Persia and Koordistan.

Prof. Lassen will soon be publishing the 1st part of the 3rd vol. of his 'Indische Alterthumeskunde.' We hear of an English translation of this valuable work having been made in London: if published in a condensed and cheap form, so as to admit of being readily re-translated into the Indian vernaculars, it would probably meet with a large sale in this country.

Extract of a letter from Dr. Weber, *dated the* 21*st October*, 1855.

"E. Renan has published in Paris an "Histoire des langues Sémitiques," a work, which embodies all the discoveries of modern

science and is an important contribution to linguistic research. Regnier has printed a somewhat voluminous book "Sur l'idiome des Vedas," which, although containing not much that is new, is a work of patient enquiry and judicious arrangement. Barthelemy St. Hilaire's work "du Buddhisme," is a good compilation. I would draw your attention to Faustboll's very valuable edition of the Dhemmapadam, accompanied by Buddhaghosa's commentary (printed at Kopenhagen). Westergard's edition of the Zend texts has been also completed. Spiegel is engaged in printing at Vienna a grammar of the Pehlvi language. Aufrecht is preparing a catalogue of the Sanskrit MSS. of the Bodleyan Library. Roth's and Bothlingk's Sanskrit dictionary has advanced to the letter ज, and the first volume, containing the vowels, will probably be issued at the end of this or the commencement of the next year. Kuhn has attacked in his journal the article in the Westminster Review (April, 1855) on the above mentioned dictionary. E. Cartius has just now published a short, but interesting paper "the Ionians," in explanation of the Oriental elements in the culture of the Greeks."

The Committee appointed by the Court of Directors to report on the Elliott MSS. have recommended the publication of the first 3 vols. at once. These were mentioned in Dr. Sprenger's notice two years ago to be ready for the press: the rest of the materials it will of course take time to examine thoroughly, but the impression is, we learn, that sooner or later the whole work can be published on the plan sketched by Elliott. It may be expedient perhaps to omit some of the selected texts, should these be published in the interim at Agra or elsewhere, but beyond this, it is to be hoped the original design will not call for alteration. Morley has undertaken to superintend the publication and is to be assisted by E. C. Bayley.

The British Museum have not purchased the Stacey collection of coins. They have already too many duplicates of the same classes that constitute the bulk of this collection to justify the Trustees in expending so large a sum in acquiring a limited number of valuable novelties. This Museum has been getting rich lately in Indian coins, having secured Lord Auckland's and Major Cunningham's latest collections, besides making some advantageous purchases at Dr. Bird's (of Bombay) auction. It has also received several important donations of coins from this country.

Our Society's Museum is the proper place for the Stacey collections if means could be found for effecting the purchase. Mr. Thomas valued the collection at £400, Major Cunningham at £500.

A reprint has been demanded of Colebrooke's Essays, and it is in contemplation to publish a vol. of James Prinsep's numismatic contributions to our Journal. This will supply a want much felt by students of Indian history, the first seven vols. of our Journal not being now obtainable. All the original copper plates from which these valuable essays were illustrated are in the possession of Mr. H. T. Prinsep.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

For January, 1856.

At the annual general meeting of the Society held on the 2nd of January, 1856.

Bábu Rámgopál Ghose, Vice-President, in the chair.

The Secretary read the following report.

Report.

The Council have the satisfaction of submitting their report on the operations of the Society for the past year, and in doing so, wish to call attention to the state of its member-list which is in every respect satisfactory.

At the close of 1851 the number of ordinary members on the Society's list was 130, during 1852 this was increased to 138, the elections of 1853-54 added 17 more, making the total at the beginning of the last year 155. Since that time there has been an accession of 13 new members while the loss during that period has been 2 by death and 5 by retirement, leaving on the Society's roll at the close of the year 161 members, of whom 33 are absent from India.

The list of honorary members has received a single addition during the year: the individual elected is the distinguished Sanskrit scholar, Rájá Rádhákant Deb.

Amongst the members lost by death during the year under review the Council have to name Major Genl. W. N. Forbes, a distinguished and most zealous member and for sometime a V. P., whose loss the Society has recorded by a vote of respect to his memory passed at its ordinary general meeting in January last. The only other member lost by death is Mr. G. C. Cheap of the Civil Service.

Finance.

Memo.:

Contributions,..... Rs.	7,166	0	0
Admissions, ...	512	0	0
Library, ...	631	14	0
Journal, ...	784	8	0
Government Grants, ...	7,368	0	0
Building, ...	1,230	0	0
Balance of 1854, ...	5,681	14	5
Miscellaneous, ...	825	8	10

The total of receipts for the year as per marginal memo. appears to be Rs. 18,517-14-10 and of disbursements Rs. 17,947-15-7, leaving a balance of Rs. 569-15-3 in favor of the Society on the year's transactions. The receipts however, include a grant from Government of Rs. 1,200 obtained for the specific purpose of paving the ground floor of the Museum with Chunar flag stones, and if this sum be excluded from the ordinary income of the year as it should be, the expenses will be found to have exceeded the receipts by Rs. 630-0-9. With reference to this excess of expenditure over income the Council have to observe that the necessity of arranging the Society's collection of fossils (A) and providing large glazed cases for the Museum (B.) and the Library (C.) has involved heavy expenses, which, however, are not likely to recur.

A. Rs.	229	0	
B. „	1,500	0	
C. „	552	8	
	2,281	8	

The liabilities of the Society including the estimated cost of the last 4 numbers of the Journal and its Index and the new catalogue of the Library amount to Rs. 2,679-2-4. To meet this, there is an available cash balauce of Rs. 7,603-2-1 or nearly three times more thau the liabilities.

The outstanding assets remain very much the same as at the close of 1854.

The probable income aud expeuditure of the ensuing year may be estimated as follows:

Income.

Contributions, ...	Rs. 8,000
Government Grants, ...	7,368
By sale of books, ...	900
Journal, ...	900
Secretary's office, ...	16
Interest of Co.'s Paper, ...	20
	17,204

Expenditure.

Establishment, ...	1,800
Museum and Contingencies, ...	7,920
Journal 7 Nos.	2,500
Library, ...	2,200
Miscellaneous, including Building, ...	1,000
	15,420

Library.

The Library has been enriched by the addition of nearly 300 volumes, including a handsome donation of about 80 volumes from the Royal Academy of Turin. Almost all the old books have been rebound and some new glazed cases have been provided for their preservation. Several of the leading scientific periodicals of Europe have been subscribed for, and a reading-room has been opened for the use of members.

The new catalogue of the Library has not yet been completed; about eight forms are still with the printer. They will, however, it is believed, be struck off within a month and the work published by February next.

Museum.

The whole of the tertiary fossils in the Society's collection amounting to upwards of 3,000 specimens have been carefully arranged and numbered. Dr. Falconer, who with the assistance of Dr. Walker kindly undertook this duty about the close of the last year, has left to the Society a detailed catalogue of the collection, which, it is hoped, will ere long be placed in the hands of the members in a printed form.

The accessions of new specimens in this department have been recorded by the Curators in their monthly reports; they include amongst others several valuable donations of earths and minerals from Upper Assam by Col. Hannay; of geological specimens from Rájmahal by Prof. Oldham, and of zoological specimens from the Somali country, by Lieut. Speke, and from Rangoon and Moulmein by Major Phayre and Mr. W. Theobold, Jr.

Journal.

The Journal has been published at intervals of about two months, and thus six numbers have been issued during the year: a seventh is nearly ready and will appear in a short time.

The Index, adverted to in the last report, has also been completed, and will be issued with the 7th number.

Secretary.

In July last Mr. Grote tendered his resignation of the office of Secretary, which he had held with so much zeal and ability for nearly four years, and the Council, as a temporary measure, appointed Mr. H. V. Bayley to officiate pending the appointment of a successor.

At the ordinary general meeting of the Society in August last, Mr. Grote was solicited to continue to render to the Society his valuable services. He was not, however, able to comply with this request owing to press of public duties, and the Society at the November meeting passed a vote of thanks for the services rendered to it by that zealous and distinguished officer.

At a subsequent meeting Mr. W. S. Atkinson was elected Secretary.

Officers.

The Council have much pleasure in recording their satisfaction at the zeal and assiduity with which the Curators and the Librarian continue to discharge their respective duties.

Oriental Fund.

The Bibliotheca Indica continues to be conducted with unabated vigour. Within the last twelve months no less than 28 Nos. have been issued from the press. Of these 14 are Arabic and the rest Sanskrit, and they include portions of ten different works edited severally by Mr. Alfred von Kremer of the Austrian Consulat at Alexandria, Dr. Roer, Mr. Hall, Bábu Rájendralál Mittra and the Maulavies of the Calcutta Madressah.

The names of the works are:—

1. A Dictionary of Technical Terms used in the sciences of the Musulmans, edited by Moulavies Mohamed Wayzh Abdul Haqq and Golam Kadir, Nos. 108, 109, 118, 129 and 132.

2. A Biographical Dictionary of persons who knew Mohammed, edited by ditto, Nos. 106, 111, 123 and 128.

3. Waqidy's History of Mohammed's Campaigns, edited by A. Von Kremer, Nos. 110, 112, 113 and 121.

4. The Surya Siddhánta with its commentary, the Gúḍhártha Prakásaka, edited by F. E. Hall, Esq. M. A. Nos. 105 and 115.

5. The Taittíriya Bráhamaṇa of the Black Yajur Veda, edited by Bábu Rájendralál Mittra, Nos. 125 and 126.

6. The Taittíriya Saṅhitá of the Black Yajur Veda, edited by Dr. E. Röer, Nos. 117, 119, 122 and 131.

7. The Márkandeya Puráṇa, edited by Rev. K. M. Banerjea, Nos. 114 and 127.

8. The Tale of Vásavadattá, by Subandhu with its commentary entitled the Darpaṇa, edited by F. E. Hall, Esq. M. A., Nos. 116 and 130.

9. The Uttara Naishadha Charita, edited by Dr. Röer, Nos. 120 and 124.

10. Tusy's list of Shiah Books, edited by Dr. A. Sprenger, No. 107.

Of these, the Council would especially draw attention to the Black Yajur, which is the only portion of the Vedas not available in Europe, and which the Hon'ble Court of Directors expressed a desire that the Society should take in hand. The Surya Siddhánta has been undertaken on the recommendation of Prof. Brockhaus, and its publication, it is hoped, will render accessible to western criticism one of the most ancient works on Hindu Astronomy. The Naishadha Charita or the adventures of Nala, king of Nishadha, forms one of the six epic poems of the Hindus to which they apply the epithet "Mahá" or the great par excellence. It includes 22 cantos of which the first eleven were published in 1836. By the publication of the concluding half, the Society has now completed the last of the several unfinished oriental works which were transferred to it by the late General Committee of Public Instruction.

Waqidy's History of Mohammed's Campaigns is a valuable contribution to Arabic History, and the interesting Tale of Vásavadattá will, the Council believe, be welcome to the lovers of Oriental literature.

In pursuance of the notice given by him at the last monthly meeting, Capt. Thuillier proposed that the question of reducing the quarterly contributions payable by members be referred to the Council for careful examination and report, and that the next ordinary general meeting be made special for the purpose of taking their report into consideration. The motion, having been seconded by Mr. Grote, was carried unanimously.

The meeting then proceeded to ballot for the Council and officers for the ensuing year. Capt. Thuillier and Dr. Thompson were appointed Scrutineers and at the close of the ballot, the chairman announced the following to be the result.

COUNCIL.

Sir James W. Colvile, Kt.	PRESIDENT.
Bábu Rámgopál Ghose,	VICE-PRESIDENTS.
Dr. G. G. Spilsbury,	
A. Grote, Esq.	
C. Allen, Esq.	
Dr. A. C. Macrae.	
C. Beadon, Esq.	
Dr. T. Thomson.	
Lt. W. N. Lees.	
Dr. T. Boycott.	
Capt. C. B. Young.	
H. Walker, Esq.	
Bábu Ramáprasád Roy.	
Capt. H. C. James.	
W. S. Atkinson, Esq.	SECRETARY.

ABSTRACT STATEMENT

OF

RECEIPTS AND DISBURSEMENTS

OF THE

ASIATIC SOCIETY,

FOR

THE YEAR, 1855.

STATEMENT

Abstract Statement of Receipts and

CONTRIBUTION							
Received from Members, ...	7,166	0	0				
				7,166	0	0	
ADMISSION FEE.							
Received from new Admissions, ...	512	0	0				
				512	0	0	
LIBRARY.							
Sale proceeds of Books, ...				631	14	0	
JOURNAL.							
Sale proceeds of, and Subscriptions to, the Journal of the Asiatic Society, ...				784	8	0	
SECRETARY'S OFFICE.							
Transfer on account of Postage paid for letters to Dr. Ross and charged under this head,..	1	8	0				
Discount on purchase of Postage Stamps, ..	1	13	3				
Lieut. Raverty, refund of Postage, ..	6	8	6				
Syud Kurmut Ali, ditto, ...	0	4	0				
				10	1	9	
GENERAL ESTABLISHMENT.							
Fine, ...				0	8	0	
DR. J. T. ROSS.							
Refund of Postage on his account, ...				1	8	0	
Carried over, ..				9,106	7	9	

No. 1.

Disbursements for 1855.

CONTRIBUTION.								
E. Thomas, Esq. refund of contributions received in excess of the amount due, ..				96	0	0		
							96	0 0
LIBRARY.								
Salary of the Librarian, 12 months, at 70 pr. m.,				840	0	0		
Establishment, ditto at 8 ditto, ...				96	0	0		
Petty Charges, ...				49	9	0		
New Book Cases, ...				552	8	0		
New Mat,..				22	7	3		
Book binding, ...				441	8	0		
Commission on sale of Books, ...				32	11	10		
Stationery, ...				3	14	0		
Postage, ...				0	1	0		
Freight, ...				4	10	0		
Lithographing, ...				5	0	0		
Printing, ...				39	0	0		
Purchase of Books, ...				248	4	0		
							2,335	9 1
JOURNAL.								
Freight, ...				93	1	6		
Petty Charges, ...				41	9	0		
Lead Cut,..				6	0	0		
Colouring Plates, ...				45	0	0		
Commission on sale of Journal, ...				6	2	9		
Lithographing, ...				806	12	0		
Printing, ...				1,633	4	9		
							2,631	14 0
SECRETARY'S OFFICE.								
General Establishment, 12 months, at 86-8 per month, ...				1,038	0	0		
Secretary's Office Establishment, at 54 ..				648	0	0		
Petty Charges, ...				26	12	9		
Stationery, ...				94	3	0		
Inward Postage, ...				34	14	0		
Purchase of Postage Stamps, ...				81	0	0		
Freight, ...				12	8	0		
Lithographing Circulars, ...				21	0	0		
Copying MSS., ...				1	4	0		
Engraving a Seal, ...				2	0	0		
Printing, ...				3	12	0		
							1,963	5 9
DR. J. T. ROSS.								
Paid Postage (by transfer) on letters addressed to him, ...						..	1	8 9
						Carried over,..	7,028	4 10

Brought forward, ..		9,106	7 9
MUSEUM OF ZOOLOGY,			
Received from the General Treasury, at 300 per month, ...	3,600 0 0		
Savings of Salary, ...	60 0 0		
Fine, ...	2 10 6		
		3,662	10 6
MUSEUM OF ECONOMIC GEOLOGY.			
Received from the General Treasury, at 314 per month, ...	3,768 0 0		
		3,768	0 0
VESTED FUND.			
Interest of Government Security, ...		29	3 7
DEPOSITS.			
F. E. Hall, Esq. on account-current, ..	91 7 0		
On account Spilsbury Testimonial, ..	425 0 0		
Rev. S. Hislop, ...	5 0 0		
Rájá Apurbakrishna Báhádur, ...	50 0 0		
Major J. C. Hannyngton, ...	32 0 0		
Major Loftie, ...	16 0 0		
Bábu Dwarkanauth Chatterjee, ...	66 8 0		
D. Grant, Esq., ...	32 0 0		
		717	15 0
H. PIDDINGTON, ESQ.			
Refund of Freight paid on his account, ...		3	0 0
E. THOMAS, ESQ.			
Refund of Postage paid on his account, ...		0	5 0
LIEUT. RAVERTY.			
Refund of cost of paper purchased on his account, ...		0	5 0
BUILDING.			
By sale of Old Beams, ...	30 0 0		
Government Grant for paving the Society's Rooms with stone, ...	1,200 0 0		
		1,230	0 0
BALANCE OF 1854.			
In the Bank of Bengal, ...	5,184 8 4		
Cash in hand, ...	28 13 10		
		5,213	6 2
Inefficient Balance, ...		468	8 3
Carried over, ..		24,199	13 3

				Brought forward, ..		7,028	4 10
Museum of Zoology.							
Salary of the Curator, E. Blyth, Esq. 250 pr. m., 12 months, ...				3,000	0 0		
House-rent, 40 ditto ditto, ...				480	0 0		
Establishment, ...				290	0 0		
Petty Charges, ...				396	1 6		
Contingent Charges on account of arranging fossils, ...				229	14 6		
Paid for 6 Glazed Cases for the fossils, ..				1,500	0 0		
Freight, ...				27	4 0		
Purchase of Stoppered Bottles, ...				20	0 0		
Printing, ...				60	0 0		
						6,003	4 0
Museum of Economic Geology.							
Salary of the Curator, H. Piddington, Esq,, ..				3,000	0 0		
Establishment, ...				420	0 0		
Contingent Charges, ...				291	5 6		
						3,711	5 6
Deposits.							
Bábu Romanauth Banourjee on account of Mr. R. Houstoun's Deposit, ...				176	0 0		
F. E. Hall's do., ...				52	4 0		
M. Kremohlz for a portrait of Dr. Spilsbury,				400	0 0		
Messrs. Mandy & Co. for a guilt frame for the above, ...				45	0 0		
						673	4 0
H. Piddington, Esq.							
Frieght paid on his account, ...					..	3	0 0
E. Thomas, Esq.							
Postage Stamps purchased on his account, ..					..	0	5 0
Lieut. Raverty.							
Paper purchased on his account, ...					..	0	5 0
W. Elliott, Esq.							
Freight paid on his account, ...					..	2	0 0
Dadoba Pundurang, Esq.							
Freight paid on his account, ...					..	2	8 0
Rev. Hislop.							
Postage Stamps purchased on his account, ..					..	0	10 0
Messrs. Williams and Norgate.							
Books purchased on their account, ..					..	11	0 0
Rev. J Wilson.							
Freight paid on his account, ...					..	2	8 0
Building.							
Sundry repairs, ...				76	0 0		
Assessment, ...				196	14 0		
						272	14 0
				Carried over, ..		17,711	4 4

Brought forward, ..	24,199	13	3
Company's Rupees,	24,199	13	3

1*st January*, 1856.

			Brought forward, ..			17,711	4 4
MISCELLANIOUS.							
Petty Charges on account Meetings, &c.,	..		201	6	3		
Printing, Advertising Meetings, &c.	..		17	1	0		
New Mat, ...	..		18	4	0		
						236	11 3
BALANCE.							
In the Bank of Bengal, ..	..		5,820	13	7		
Cash in hand, ...	..		62	10	7		
						5,883	8 2
Inefficient Balance, ...	..					368	5 6
		Company's Rupees				24,199	13 3

E. E.

W. S. ATKINSON,
Secretary.

STATEMENT

CASH. *Abstract of the Oriental*

SALE OF ORIENTAL PUBLICATIONS.			
Sale proceeds of, and subscriptions to, the Bibliothica Indica,	1,012	15	3
VESTED FUND.			
Interest of Company's Paper, ...	361	1	0
PRA'KRIT GRAMMAR.			
Received back from Bábu Rájendralál Mittra by transfer,..	50	0	0
GOVERNMENT ALLOWANCE, ...	6,000	0	0
CUSTODY OF ORIENTAL WORKS.			
Fine, ...	0	9	6
Carried over, ..	7,424	9	9

No. 2.

Fund for the year 1855.

SALE OF ORIENTAL PUBLICATIONS.				
Freight, ...	57 1 0			
Petty Charges, ...	20 0 6			
Stationery, ...	9 0 0			
Postage, ...	20 9 0			
Commission on sale of Books, ...	59 15 10			
		166	10	4
UTTARA NAISHADHA.				
Printing Charges, ...		448	0	0
COPYING OF MSS.				
Copying of ditto, ...		67	1	9
COPYING OF PURA'NS.				
Copying of ditto, ...		69	3	9
PRA'KRIT GRAMMAR.				
Editing Charges, ...		50	0	0
FUTOOH-UL SHA'M.				
Printing Charges, ...		444	4	0
CUSTODY OF ORIENTAL WORKS.				
Salary of the Librarian, Bábu Rájendralál Mittra at 30, ...	360 0 0			
Establishment at 12, ...	144 0 0			
Book-binding, ...	119 2 0			
Petty Charges, ...	23 15 6			
Stationery, ...	6 7 0			
Postage, ...	2 4 0			
Purchase of a copy of Ziz Alogbegi, ..	60 0 0			
		715	12	6
DICTIONARY OF TECHNICAL TERMS.				
Printing Charges, ...	1,708 8 0			
Editing Charges, ...	588 0 0			
		2,296	8	0
BIOGRAPHICAL DICTIONARY.				
Printing Charges, ...	504 0 0			
Editing Charges, ...	249 8 0			
		753	8	0
WAQIDY.				
Postage, ...	34 0 0			
Freight, ...	11 6 0			
		45	6	0
CONQUEST OF SYRIA.				
Printing Charges, ...		783	0	0
APHORISMS OF THE VEDANTA.				
Printing Charges, ...		298	6	0
	Carried over, ..	6,137	12	4

Brought forward, ..	7,424	9	9
BLACK YAJUR VEDA.			
Received back (by transfer) from Dr. E. Röer, the sum advanced to him, ...	100	0	0
LALITA VISTARA.			
Received back (by transfer) from Bábu Rájendralál Mittra,	220	0	0
BLACK YAJUR BRA'HMANA.			
Received back (by transfer) from Bábu Rájendralál Mittra,	330	0	0
BALANCE OF 1854.			
In the Bank of Bengal, ... 1,985 11 8			
Cash in hand, ... 45 6 11			
	2,031	2	7
Inefficient Balance, ...	5	0	0
Company's Rupees,	10,110	12	4

1*st January*, 1856.

	Brought forward, ..	6,137	12 4
BLACK YAJUR VEDA.			
Printing Charges, ...		228	6 0
TUSY'S LIST.			
Printing Charges, ...	516 0 0		
Editing ditto, ...	32 0 0		
		548	0 0
SURYA SIDDHA'NTA.			
Postage, ...	22 4 0		
Printing Charges, ...	224 0 0		
		246	4 0
LALITA VISTARA.			
Editing Charges, ...		220	0 0
CHAITANYA CHANDRODAYA.			
Printing Charges, ...		249	4 0
VA'SAVADATTA'.			
Postage, ...		3	2 0
BIBLIOTHECA INDICA.			
Freight, ...	129 0 6		
Postage, ...	5 13 0		
		134	13 6
BLACK YAJUR BRA'HMAṆA.			
Editing Charges, ...		330	0 0
BALANCE.			
In the Bank of Bengal, ...	1,064 0 8		
Cash in hand, ...	19 9 10		
		1,083	10 6
Inefficient Balance, ...	..	929	8 0
	Company's Rupees,	10,110	12 4

E. E.

W. S. ATKINSON,
Secretary.

STATEMENT No. 3.

Assets.

CASH.			
Bank of Bengal,..... Rs.	5,820	13	7
Cash in hand, ...	62	10	7
Inefficient Balance,.....	368	5	6
Government Agent, ...	500	0	0
Williams and Norgate, ...	838	8	0
Bank of Bengal on account of Journal, ...	108	12	5
	7,699	2	1
OUTSTANDING.			
Contributions and Admission Fees,.....	7,701	7	8
Subscriptions to the Journal, ...	1,050	12	0
Sale of Journal, ...	68	8	0
Library, ...	479	0	0
Sundries and Postage, ...	45	15	0
	9,345	10	8

Liabilities.

Hon'ble Sir J. W. Colvile Kt. ..... Rs.	291	8	0
J. W. Laidlay, Esq.	418	7	0
Journal, Nos. IV. to VII. say, ...	900	0	0
Printing of Index, ...	350	0	0
Ditto of Catalogue, ...	500	0	0
Sundry small deposits, ...	219	3	0
	2,679	2	0

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Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1855.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the cistern of the Standard Barometer above the level of the Sea, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	*Sunday.*							
2	29.460	29.518	29.417	0.101	81.3	84.2	78.3	5.9
3	.504	.591	.444	.147	81.3	86.0	78.8	7.2
4	.627	.696	.557	.139	80.1	87.0	78.0	9.0
5	.657	.701	.585	.116	81.7	87.4	76.2	11.2
6	.611	.668	.550	.118	80.9	83.8	78.6	5.2
7	.572	.626	.505	.121	83.8	90.0	80.8	9.2
8	*Sunday.*							
9	.488	.548	.409	.139	83.5	89.5	80.4	9.1
10	.416	.479	.337	.142	81.6	87.6	78.5	9.1
11	.441	.535	.386	.149	80.6	84.8	78.2	6.6
12	.556	.637	.506	.131	81.2	85.4	78.5	6.9
13	.619	.682	.560	.122	82.8	88.0	78.7	9.3
14	.641	.685	.578	.107	83.1	86.2	80.6	5.6
15	*Sunday.*							
16	.508	.589	.435	.154	83.3	92.2	80.3	11.9
17	.439	.483	.373	.110	83.2	87.7	80.4	7.3
18	.458	.556	.404	.152	82.0	85.0	79.4	5.6
19	.567	.617	.522	.095	80.6	84.0	78.0	6.0
20	.590	.641	.526	.115	82.7	86.7	79.0	7.7
21	.620	.670	.545	.125	83.7	89.7	80.2	9.5
22	*Sunday.*							
23	.526	.580	.444	.136	83.0	89.2	80.3	8.9
24	.470	.518	.396	.122	82.2	87.4	80.2	7.2
25	.427	.481	.348	.133	83.6	88.6	80.6	8.0
26	.434	.506	.379	.127	84.6	90.2	81.2	9.0
27	.491	.545	.434	.111	83.2	88.8	81.0	7.8
28	.463	.514	.394	.120	81.7	84.2	78.2	6.0
29	*Sunday.*							
30	.440	.492	.392	.100	82.2	84.6	80.3	4.3
31	.433	.477	.379	.098	82.4	87.5	80.6	6.9

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1855.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. *(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional weight of vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	*Sunday.*							
2	79.6	1.7	78.7	2.6	0.961	10.35	0.89	0.921
3	79.4	1.9	78.4	2.9	.952	.25	.99	.912
4	78.1	2.0	77.1	3.0	.913	9.86	.98	.910
5	78.9	2.8	77.5	4.2	.925	.96	1.41	.876
6	79 2	1.7	78.3	2 6	.949	10.22	0.88	.921
7	81.2	2.6	79.9	3.9	.998	.69	1.41	.883
8	*Sunday.*							
9	81.0	2.5	79.7	3.8	.992	.63	.37	.886
10	79.7	1.9	78.7	2.9	.961	.35	0.99	.913
11	78.8	1.8	77.9	2.7	.937	.10	.91	.917
12	79.0	2.2	77.9	3.3	.937	.10	1.11	.901
13	79.6	3.2	78.0	4.8	.940	.09	.66	.859
14	80.2	2.9	78.7	4.4	.961	.33	.53	.871
15	*Sunday.*							
16	80.1	3·2	78.5	4.8	.955	.25	.68	.859
17	80.0	3.2	78.4	4.8	.952	.21	.68	.859
18	79.2	2.8	77.8	4.2	.934	.05	.42	.876
19	78.7	1.9	77.7	2.9	.931	.04	0.97	.912
20	80.1	2.6	78.8	3.9	.964	.36	1.36	.884
21	80.5	3.2	78.9	4.8	.967	.37	.70	.859
22	*Sunday.*							
23	80.7	2.3	79.5	3.5	.986	.57	.25	.894
24	80.6	1.6	79.8	2.4	.995	.71	0.83	.928
25	81.0	2.6	79.7	3.9	.992	.63	1.40	.884
26	80.9	3.7	79.0	5.6	.970	.37	2.02	.837
27	80.7	2.5	79.4	3.8	.983	.54	1.35	.886
28	79.7	2.0	78.7	3.0	.961	.35	.02	.910
29	*Sunday.*							
30	80.3	1.9	79.3	2.9	.979	.53	.01	.912
31	80.6	1.8	79.7	2.7	.992	.66	0.95	.918

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1855.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. *(Continued.)*

Hour.	Mean Height of the Barometer at 32° Faht.	Range of the Barometer for each hour during the Month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the Month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.537	29.690	29.429	0.261	81.1	82.1	79.4	2.7
1	.523	.681	.423	.258	80.8	81.9	78.8	3.1
2	.511	.675	.407	.268	80.5	81.7	78.4	3.3
3	.497	.668	.392	.276	80.2	81.8	78.4	3.4
4	.499	.659	.386	.273	80.0	81.4	78.0	3.4
5	.508	.679	.396	.283	79.7	81.2	78.0	3.2
6	.524	.690	.410	.280	79.6	81.2	78.4	2.8
7	.536	.701	.428	.273	80.1	82.0	76.6	5.4
8	.547	.693	.445	.248	81.2	83.6	78.2	5.4
9	.552	.685	.450	.235	82.2	85 4	78.4	7.0
10	.552	.692	.448	.244	83.4	87.6	79.4	8.2
11	.546	.691	.435	.256	84.5	88.5	79 6	8.9
Noon.	.533	.672	.411	.261	85.6	89.6	79.7	9.9
1	.513	.649	.385	.264	86.0	90.0	79.9	10.1
2	.494	.632	.372	.260	85.2	89.5	81.1	8.4
3	.477	.630	.347	.283	85.1	92.2	80.2	12.0
4	.458	.613	.337	.276	84.2	90.2	78 6	11.6
5	.464	.624	.340	.284	83.7	89.8	78.8	11.0
6	.476	.635	.357	.278	83.1	85 8	78.8	7.0
7	.496	.652	.374	.278	82.5	84.9	78 6	6.3
8	.519	.679	.394	.285	82.2	84.2	79.0	5.2
9	.542	.689	.407	.282	82.0	83.6	78.8	4·8
10	.555	.696	.420	.276	81.7	83.0	79.0	4.0
11	.555	.696	.425	.271	81.4	82.7	79.6	3.1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1855.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. *(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Midnight.	79.5	1.6	78.7	2.4	0.961	10.37	0.80	0.928
1	79.3	1.5	78.5	2.3	.955	.31	.76	.931
2	79.2	1.3	78.5	2.0	.955	.31	.67	.939
3	78.9	1.3	78.2	2 0	.946	.21	.67	.938
4	78 8	1.2	78.2	1.8	.946	.21	.60	.944
5	78.6	1.1	78.0	1.7	.940	.15	.57	.947
6	78.5	1.1	77.9	1.7	.937	.12	.57	.947
7	78.8	1.3	78.1	2.0	.943	.18	.66	.939
8	79.4	1.8	78.5	2.7	.955	.29	.92	.918
9	79.8	2.4	78.6	3.6	.958	.30	1.24	.893
10	80.3	3.1	78.7	4.7	.961	.31	.65	.862
11	80.9	3.6	79.1	5.4	.973	.42	.93	.844
Noon.	81.4	4.2	79.3	6.3	.979	.46	2 30	.820
1	81.7	4 3	79.5	6.5	.986	.51	.40	.814
2	81.3	3.9	79.3	5.9	.979	.46	.15	.830
3	81.3	3.8	79.4	5.7	.983	.49	.08	.835
4	80.6	3.6	78.8	5.4	.964	.34	1.90	.845
5	80.5	3.2	78.9	4.8	.967	.37	.70	.859
6	80.3	2.8	78.9	4.2	.967	.39	.47	.876
7	80.0	2.5	78.7	3.8	.961	.33	.31	.887
8	79.8	2.4	78.6	3.6	.958	.30	.24	.893
9	79.8	2.2	78.7	3.3	.961	.35	.12	.902
10	79.7	2.0	78.7	3.0	.961	.35	.02	.910
11	79.6	1.8	78.7	2.7	.961	.35	0.92	.918

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1855.

Solar radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	*Sunday.*			Sunday.
2	..	..	E. or S. or S. E.	Cloudy and also raining at 4 A. M.
3	..	1.76	S. E. or N. E. or S.	Cloudy and constantly raining.
4	..	1.10	S. or S. W.	Cloudy and occasionally raining.
5	..	0.34	S.	Cloudy and also raining between 5 & 9 A. M.
6	..	1.42	S. or S. W. or S. E.	Cloudy and constantly raining.
7	125.5	0.42	S.	Cloudy and also raining between 3 and 4 A. M.
8	*Sunday.*	0.80		Sunday.
9	117.2	..	S. or N. E.	Cloudy with occasional rain.
10	..	3.42	E. or S. W.	Ditto.
11	..	1.16	S. E. or S.	Cloudy and constantly raining.
12	..	0.62	S. or S. E.	Cloudy and also rain before sun rise.
13	..	..	S. E. or S.	Cloudy.
14	..	..	S. or S. E.	Ditto.
15	*Sunday.*			Sunday.
16	..	..	W. or N.W. or N. or E.	Cloudy with occasional rains.
17	..	0.54	E. or N. or S. E.	Cloudy.
18	..	0.88	E. or S.	Cloudy with heavy rains before sun rise.
19	..	0.48	N. E. or S. E.	Cloudy with rain till 9 A. M.
20	..	..	E. or S. E.	Cloudy.
21	..	0.26	S. E. or N. E. or E.	Cloudless till 5 A. M. cloudy afterwards, also drizzling at 2 P. M.
22	*Sunday.*			Sunday.
23	..	0.46	N. E. or N. or E.	Cloudy and also raining at 4 P. M.
24	..	0.68	N. E. or N. N. E.	Cloudy with occasional rains.
25	..	..	N. E.	Cloudy and raining at 4¼ P. M.
26	..	0.24	N. E.	Cloudy and also drizzling at 1 P. M.
27	..	0.75	N. E. or E.	Cloudy and also raining between Noon and 3 P. M.
28	..	0.60	E or S.	Cloudy and constantly raining.
29	*Sunday.*	1.23		Sunday.
30	..	0.43	S. S. W. or S.	Cloudy and constantly raining.
31	..	1.59	S.	Ditto.

\i Cirri, _i Cirro-strati, ^i Cumuli, ^_i Cumulo-strati, _i Nimbi, —i Strati, \^i Cirro-cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1855.

Latitude 22° 33′ 1″ North, Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Level of the Sea 18.11 feet

Daily Means, &c. of the Observations, and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches	Inches.	Inches.	Inches.	o	o	o	o
1	29.449	29.499	29.388	0.111	80.7	81.4	79.9	1 5
2	.466	.512	.423	.089	80.8	85.0	77.8	7.2
3	.437	.478	.376	.102	79.5	81.2	77.8	2.4
4	.437	.497	.389	.108	82.1	85.6	79.8	5.8
5	*Sunday.*							
6	.509	.554	.470	.084	83.3	87.8	78.0	9.8
7	.511	.563	.451	.112	84 2	89.2	81.4	7.8
8	.528	.577	.479	.098	82.6	89.6	78.6	11·0
9	.555	.611	.492	.119	83.4	87.4	80.6	6.8
10	.632	.713	.551	.162	85.1	90.8	81.3	9.5
11	.699	.755	.642	.113	84.6	90.1	81.0	9.1
12	*Sunday.*							
13	.599	.651	.543	.108	85.6	91.5	80.2	11.3
14	.651	.712	.610	.102	87.3	92.6	83.2	9.4
15	.720	.783	.673	.110	87.5	93.2	84.2	9.0
16	.733	.795	.645	.150	86.5	92.4	82.6	9.8
17	.681	.739	.598	.141	85.9	90.8	82.8	8.0
18	.593	.647	.498	.149	85.9	91.3	79.0	12.3
19	*Sunday.*							
20	.575	.632	.496	.136	83.6	89.6	79.6	10.0
21	.531	.590	.471	.119	84 1	89.3	81.4	7.9
22	.485	.538	.381	.157	81.8	85.8	79.7	6.1
23	.477	.541	.426	.115	83.1	88.2	80.0	8.2
24	.535	.613	.481	.132	83.0	86.8	80.4	6.4
25	.567	.624	.497	.127	83.4	88.4	79.7	8.7
26	*Sunday*							
27	.522	.568	.451	.117	83.9	88.7	80.8	7.9
28	.552	.612	.501	.111	83.4	88.0	80.2	7.8
29	.618	.681	.567	.114	82.7	87.8	80.2	7.6
30	.665	.710	.611	.099	82.8	86.6	80.3	6.3
31	.694	.765	.622	.143	83.5	87.8	80.0	7.8

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1855.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. *(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.1	1.6	78.3	2.4	0.949	10.24	0.80	0.928
2	78.5	2.3	77.3	3.5	.919	9 90	1.17	.894
3	77.8	1.7	76.9	2.6	.908	.80	0.86	.919
4	79.6	2.5	78.3	3.8	.949	10.20	1.31	.886
5	*Sunday.*							
6	80.6	2.7	79.2	4.1	.979	.48	.45	.878
7	81.3	2.9	79.8	4.4	.995	.66	.58	.871
8	80.1	2.5	78.8	3.8	.964	.36	.32	.887
9	80.9	2.5	79.6	3.8	.989	.60	.36	.886
10	81.4	3.7	79.5	5.6	.986	.53	2.04	.838
11	81.4	3.2	79.8	4.8	.995	.64	1.75	.859
12	*Sunday.*							
13	81.8	3.8	79.9	5.7	.998	.65	2.11	.835
14	81.7	5.6	78.9	8.4	.967	.30	3.11	.768
15	82.7	4.8	80.3	7.2	1.011	.76	2.73	.798
16	81.8	4.7	79.4	7.1	0.983	.47	.63	.799
17	81.8	4.1	79.7	6.2	.992	.59	.28	.823
18	82.2	3.7	80.3	5.6	1.011	.78	.09	.838
19	*Sunday.*							
20	79.9	3.7	78.0	5.6	0.940	.07	1.96	.837
21	80.8	3.3	79.1	5.0	.973	.42	.79	.853
22	80.1	1.7	79.2	2.6	.976	.50	0.90	.921
23	80.7	2.4	79.5	3.6	.986	.57	1.29	.891
24	80.5	2.5	79.2	3.8	.976	.48	.34	.887
25	79.9	3.5	78.1	5.3	.943	.12	.84	.846
26	*Sunday.*							
27	81.2	2.7	79.8	4.1	.995	.66	.47	.879
28	80.5	2.9	79.0	4.4	.970	.42	.54	.871
29	80.2	2.5	78.9	3.8	.967	.39	.33	.887
30	80.3	2.5	79.0	3.8	.970	.42	.33	.887
31	80.6	2.9	79.1	4.4	.973	.45	.55	.871

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1855.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.584	29.762	29.446	0.316	81.9	85.4	77.8	7.6
1	.570	.746	.419	.327	81.6	85.1	77.9	7.2
2	.558	.735	.410	.325	81·5	85.0	78.0	7 0
3	.548	.728	.400	.328	81.3	84.9	78.0	6.9
4	.545	.723	.388	.335	81.2	84.8	78.0	6.8
5	.556	.729	.401	.328	81.2	84.4	78.2	6·2
6	.572	.745	.428	.317	81.0	84 2	78.2	6.0
7	.587	.763	.446	.317	81.5	85.0	78.0	7.0
8	.602	.790	.454	.336	82.9	87.0	78.7	8 3
9	.612	.795	.468	.327	84.2	88.6	78.8	9.8
10	.617	.794	.475	.319	85.5	90.4	79.2	11.2
11	.608	.777	.476	.301	86.5	91.6	80.6	11.0
Noon.	.593	.768	.451	.317	87.3	92.4	81.2	11.2
1	.574	.741	.437	.304	87.5	92.3	80.4	11.9
2	.551	.712	.405	.307	87.0	92.6	80.0	12.6
3	.531	.690	.394	.296	86.9	93.2	80.0	13.2
4	.517	.673	.378	.295	86.1	91.8	80.2	11.6
5	.514	.674	.376	.298	85.6	90.7	79.7	11.0
6	.529	.685	.392	.293	84.6	89.6	79.4	10.2
7	.549	.709	.409	.300	83.5	88.0	78.6	9.4
8	.574	.747	.427	.320	83.1	87.4	78 6	8.8
9	.592	.758	.450	.308	82.6	86.6	78.0	8.6
10	.606	.777	.457	.320	82.3	86.4	77.9	8.5
11	.606	.783	.460	.323	82.1	85.6	77.8	7.8

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1855.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. *(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Midnight.	80.0	1.9	79.0	2.9	0.970	10.44	1.00	0.913
1	79.9	1.7	79.0	2.6	.970	.44	0.90	.921
2	79.9	1.6	79.1	2.4	.973	.49	.82	.927
3	79.7	1.6	78.9	2.4	.967	.43	.81	.928
4	79.7	1.5	78.9	2.3	.967	.43	.78	.930
5	79.6	1.6	78.8	2.4	.964	.40	.81	.928
6	79.6	1.4	78.9	2.1	.967	.43	.71	.936
7	79.8	1.7	78.9	2.6	.967	.41	.90	.920
8	80.5	2.4	79.3	3.6	.979	.51	1.28	.891
9	80.9	3.3	79.2	5.0	.976	.45	.79	.854
10	81.2	4.3	79.0	6.5	.970	.35	2.37	.814
11	81.6	4.9	79.1	7.4	.973	.38	.72	.792
Noon.	82.0	5.3	79.3	8.0	.979	.42	.99	.777
1	81.9	5.6	79.1	8.4	.973	.36	3.13	.768
2	81.8	5.2	79.2	7.8	.976	.39	2.90	.782
3	81.9	5.0	79.4	7.5	.983	.45	.80	.789
4	81.6	4.5	79.3	6.8	.979	.44	.51	.806
5	81.4	4.2	79.3	6.3	.979	.46	.30	.820
6	81.0	3.6	79.2	5.4	.976	.45	1.94	.843
7	80.6	2.9	79.1	4.4	.973	.45	.55	.871
8	80.6	2.5	79.3	3.8	.979	.51	.35	.886
9	80.1	2.5	78.8	3.8	.964	.36	.32	.887
10	80.1	2.2	79.0	3.3	.970	.44	.14	.902
11	80.1	2.0	79.1	3.0	.973	.47	.04	.910

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1855.

Solar radiation, Weather, &c.

Date.	Max Solar radiation.	Rain.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	..	0.20	S. W. or S.	Cloudy and drizzling occasionally.
2	..	..	S. W. or S. or S. E.	Cloudy and raining or drizzling occasionally.
3	..	0.36	S. W. or S.	Cloudy and raining or drizzling occasionally.
4	..	..	S. W.	Cloudy.
5	*Sunday.*	0.50		
6	..	0.80	S. W. or W.	Cloudy and raining between 2 & 8 A.M.
7	..	0.52	Calm or W. or S.W. or	Cloudy and rain at 2 & 9 P. M.
8	..	0.41	S. W. [S. S. W.	Cloudy and raining occasionally.
9	..	..	S. W. or S. S. W.	Cloudy.
10	..	..	S. or S. W.	Ditto.
11	..	0.10	S. or S. W.	Cloudy and a shower of rain at 5 P. M.
12	*Sunday.*	0.46		
13	126.0	0.61	S. or S. W.	Scattered clouds and also rain at midnight and 1 A. M.
14	124.8	..	S. W.	Scattered clouds.
15	130.0	..	S. W. or variable.	Scattered ⌇i or ⌒i.
16	135.0	..	S.	Scattered ⌒i till 7 P. M. cloudless afterwards.
17	125.4	..	S.	Cloudless till 6 A. M. scattered ⌒i or ⌇i afterwards.
18	115.0	2.30	S. or S. W. or S.S.E.	Cloudy and raining between 9 & 11 A. M.
19	*Sunday.*	0.37		
20	125.0	..	S. or S. W. or N. E.	Scattered clouds also drizzling at 9 P.M.
21	120.0	..	N. E.	Scattered clouds of various kinds.
22	..	1.35	Calm or W.	Cloudy and drizzling between 11 A. M. and 7 P M.
23	..	0.10	W. or E. or S. E.	Cloudy and raining at 5 P. M.
24	..	..	E. or S. E. or S.	Scattered ⌒i or ⌇i.
25	133.0	..	S. E. or S.	Scattered ⌒i.
26	*Sunday.*	..		
27	126.0	0.32	E. or N. E.	Scattered ⌇i or ⌒i also raining at 3 P.M.
28	..	0.60	E. or N. E.	Scattered ⌇i and ⌇i till 7 A. M. cloudy afterwards, also raining at 3 P. M.
29	..	1.31	N. E. or E.	Cloudy and constantly raining.
30	130.0	0.62	E.	Cloudy and constantly raining.
31	..	0.14	E. S. E. or E. or S.E.	Scattered ⌒i. or ⌇i or ⌇i.

⌇i Cirri, ⌇i cirro strati, ⌒i cumuli, ⌒i cumulo strati, ⌇i nimbi, —i strati, ⌇ cirro cumuli.

Meteorological Register kept at the Office of the Secretary to Government, N. W. P. Agra, for the month of June, 1855.

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Direction of Wind.	Quantity of Rain.	Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.			
1	29.155	98.0	97.8	75.0	W.	..	Clear.
2	29.169	98.5	98.2	75.6	W.	..	Ditto.
3	29.249	100.0	99.8	79.5	N. W.	..	Ditto.
4	29.231	100.8	100.9	78.5	N. W.	..	Ditto.
5	29.209	101.5	101.4	73.5	N. W.	..	Ditto.
6	29.181	102.8	103.3	73.0	N. W.	..	Ditto.
7	29.127	104.3	103.9	74.0	N. W.	..	Ditto.
8	29.117	104.0	105.0	70.0	N. W.	..	Ditto.
9	29.191	100.9	101.3	69.5	N.	..	Ditto.
10	29.193	103.1	103.0	71.8	N. W.	..	Ditto.
11	29.155	106.6	106.7	68.5	W.	..	Ditto.
12	29.151	104.9	105.0	75.0	S. W.	..	Ditto.
13	29.145	97.9	98.0	78.4	W.	..	Ditto.
14	29.137	98.9	98.9	97.4	W.	..	⌇ scattered.
15	29.201	94.0	94.0	78.0	E.	..	∼ ditto.
16	29.223	93.7	93.9	77.0	E.	..	∩ ditto.
17	29.145	100.6	101.5	78.5	N. W.	..	Clear.
18	29.167	97.8	97.2	80.5	E.	..	Ditto.
19	29.189	90.5	85.7	74.0	E.	..	⌇ towards east.
20	29.139	93.9	93.9	82.0	E.	..	∼ scattered all over.
21	29.173	86.0	84.8	77.9	W.	..	⌇ all over.
22	29.193	92.3	93.0	82.0	N. E.	..	∼ very few scattered.
23	29.165	94.0	94.5	83.0	N. E.	..	— scattered.
24	29.107	98.5	98.8	79.0	N. W.	..	Clear.
25	29.137	100.0	100.0	81.4	N. W.	..	∼ scattered.
26	29.097	101.0	101.2	81.4	N. W.	..	∼ ditto.
27	29.015	97.6	98.0	82.4	S. W.	..	⌇ ditto.
28	29.069	93.5	92.5	82.5	N. E.	..	⌇ ditto.
29	29.041	86.0	85.5	81.6	E.	1,55	⌇ all over.
30	29.027	90.5	91.1	84.2	S. E.	..	⌇ scattered.
Mean.	29.149	97.7	97.6	77.5		1,55	

Barometer Observations corrected for Capillarity only.

Symbols.
- \ Cirus.
- — Cirro strata.
- ∩ Cumuli.
- ∼ Cumulo strata.
- ⌇ Nimbi or Nimbus.

Meteorological Register kept at the Office of the Secretary to Government, N. W. P. Agra, for the month of June, 1855.

Observations at apparent Noon.							
Date.	Barometer.	Temperature.			Direction of Wind.	Quantity of Rain.	Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.			
1	29.141	101.5	100.6	75.5	N. W.	..	Clear.
2	29.147	103.5	103.5	76.0	S. W.	..	∼ scattered.
3	29.231	102.9	102.9	82.0	N. W.	..	Clear.
4	29.211	105.5	104.2	78.2	N. W.	..	Ditto.
5	29.179	105.8	106.2	75.5	N. W.	..	Ditto.
6	29.147	107.8	108.0	73.0	N. W.	..	Ditto.
7	29.115	108.1	107.8	74.0	N. W.	..	Ditto.
8	29.107	107.6	108.4	72.4	N. W.	..	Ditto.
9	29.189	103.9	163.5	70.0	N. W.	..	Ditto.
10	29.175	107.0	107.0	75.4	W.	..	Ditto.
11	29.135	110.8	111.0	69.7	N. W.	..	Ditto.
12	29.125	108.6	107.8	76.0	W.	..	Ditto.
13	29.129	102.3	102.8	78.4	W.	..	Ditto.
14	29.105	102.0	102.0	78.5	N. W.	..	Ditto.
15	29.189	97.5	97.5	78.7	E.	..	∼ scattered.
16	29.205	95.8	95.0	77.5	E.	..	∩ ditto.
17	29.121	102.8	103.5	80.	N. W.	..	Ditto.
18	29.161	100.8	101.0	80.2	E.	..	Clear.
19	29.173	88.9	86.5	77.0	E.	..	⌇ all over.
20	29.133	95.5	95.5	82.0	E.	..	⌇ scattered all over.
21	29.159	89.5	89.2	78.5	N. W.	..	⌇ all over.
22	29.179	95.0	95.5	81.3	N. E.	..	⌇ scattered
23	29.137	96.5	98.0	81.5	S. E.	..	∼ ditto.
24	29.093	103.0	103.4	79.5	N. W.	..	Clear.
25	29.097	99.5	95.5	80.4	S.	..	⌇ all over.
26	29.077	102.4	103.0	81.4	W.	..	∼ scattered.
27	29.011	99.9	100.0	82.5	W.	..	⌇ ditto.
28	29.039	95.0	94.6	81.6	N. E.	..	⌇ ditto.
29	29.041	87.0	85.3	82.0	S.	..	⌇ all over.
30	28.995	92.8	92.3	84.4	S. E.	..	⌇ scattered.
Mean.	29.131	100.9	100.3	78.1			

Meteorological Register kept at the Office of the Secretary to Government, N. W. P. Agra, for the month of June, 1855.

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky	Direction of Wind.	Quantity of Rain.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.			
1	29.051	106.9	105.6	76.2	107.0	89.0	98.0	Clear.	N. W.	..
2	29.093	105.2	104.4	76.4	105.0	91.3	98.15			
3	29.137	106.0	105.4	80.4	106.0	90.0	98.0	Clear.	N. W.	..
4	29.121	108.8	108.0	79.0	109.0	92.0	100.5	∿ scattered.	N. W.	..
5	29.087	110.2	110.4	74.0	110.0	90.0	100.0			
6	29.089	111.0	110.0	72.8	110.5	90.	100.25	Clear.	N. W.	..
7	29.045	112.0	111.5	74.2	111.5	94.4	102.95	∿ scattered.	N. W.	..
8	29.049	111.9	111.3	72.9	111.5	93.7	102.6	Clear.	N.	..
9	29.131	109.5	108.4	72.4	109.2	83.8	96.5	Ditto.	N. W.	..
10	29.101	111.9	111.6	71.4	111.5	83.7	97.6	Ditto.	W.	..
11	29.057	115.0	114.9	71.5	114.5	86.0	100.25	Ditto.	N. W.	..
12	29.077	112.0	111.0	75.3	111.5	92.0	101.75	Ditto.	W.	..
13	29.041	108.1	107.5	78.4	108.0	94.0	101.0	Ditto.	S.	..
14	29.009	106.5	105.5	79.4	106.0	92.0	99.0	∿ scattered.	S.	..
15	29.105	102.0	102.5	81.4	102.2	85.5	93.85	∿ ditto.	E.	..
16	29.099	104.0	104.0	77.5	105.0	85.8	95.4	Ditto.	N. E.	..
17	29.033	108.5	108.0	78.8	108.0	90.0	99.0	Clear.	N.	..
18	29.073	105.7	106.4	83.4	106.0	90.5	98.25	Ditto.	E.	..
19	29.071	93.5	92.5	77.1	92.5	84.0	88.25	Hazy.		
20	29.021	98.9	98.9	82.0	99.	83.5	91.25	Clear. [over.	E.	..
21	29.061	95.8	95.8	80.0	96.0	83.0	89.5	∿ scattered all	S. E.	..
22	29.093	98.0	98.7	82.2	99.0	84.0	91.5	∿ scattered.	N. E.	..
23	29.023	102.8	102.3	81.1	102.0	86.8	94.4	Clear.	N. W.	..
24	28.999	108.8	108.5	77.4	108.0	90.8	99.4	∿ scattered.	N. W.	..
25	29.025	97.9	97.0	80.4	100.0	93.0	96.5	∿ all over.	W.	..
26	28.973	106.7	107.0	81.5	106.8	89.7	98.25	∿ scattered.	W.	..
27	28.925	90.9	88.4	82.0	100.0	87.5	93.75	∿ all.	S. E.	..
28	28.961	94.9	94.5	80.8	95.5	85.5	90.5	∿ scattered.	E.	..
29	28.977	89.9	89.4	83.0	90.0	77.5	83.75	∿ ditto.	S. E.	..
30	28.999	85.8	84.9	81.6	92.0	81.0	86.5	∿ all over.	N. W.	1.12
Mean.	28.717	101.9	105.4	78.1	104.7	88.0	96.22			1.12

Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the month of July, 1855.

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Direction of Wind.	Quantity of Rain.	Aspect of the sky.
		Of Mercury.	Of Air.	Wet Bulb.			
1	29.055	87.5	88.5	83.2	N. E.	..	⌇ scattered.
2	29.027	82.8	82.8	80.5	N.	0.22	⌇ all over.
3	28.971	84.8	85.4	80.9	N. E.	0.12	⌇ scattered.
4	29.071	84.2	84.5	81.0	S. E.	..	⌇ all over.
5	29.155	85.9	86.3	82.1	N.	..	⌇ scattered.
6	29.139	87.6	87.8	83.2	N. E.	..	⌇ ditto.
7	29.143	87.7	87.8	84.2	W.	..	⌇ ditto.
8	29.105	86.2	86.4	83.0	W.	..	⌇ ditto.
9	29.093	84.8	85.2	82.0	W.	..	⌇ ditto.
10	29.071	86.0	86.5	81.5	N. E.	0.27	⌇ ditto.
11	29.079	85.6	86.0	82.5	S. E.	0.22	⌇ ditto.
12	29.083	86.5	86.6	81.4	E.	0.17	⌇ ditto.
13	29.061	84.9	85.5	79.5	S. E.	..	⌇ ditto.
14	29.217	86.6	86.9	80.5	S. W.	..	⌇ ditto.
15	29.205	86.0	86.5	80.2	N. E.	..	⌇ ditto.
16	29.137	87.0	87.6	80.2	W.	..	⌇ ditto.
17	29.063	83.0	82.0	79.0	W.	..	⌇ all over.
18	29.085	83.3	81.0	79.0	E.	..	⌇ ditto.
19	29.115	85.0	86.0	81.0	N. E.	0.12	⌇ scattered.
20	29.125	83.5	84.0	80.5	E.	0.67	⌇ all over.
21	29.167	83.2	84.0	81.0	S. E.	..	⌇ ditto.
22	29.169	81.5	81.5	80.0	..	..	⌇ ditto.
23	29.177	81.0	81.0	79.3	S. W.	..	⌇ ditto.
24	29.087	79.6	79.4	78.7	S. W.	0.52	⌇ ditto.
25	29.115	81.8	83.0	81.2	S. E.	0.82	⌇ ditto.
26	29.109	83.9	84.2	81.2	W.	0.52	⌇ scattered.
27	29.175	84.9	85.3	81.9	S. W.	..	⌇ ditto.
28	29.117	85.2	85.5	81.9	W.	..	⌇ ditto.
29	29.105	83.4	83.8	81.8	N. W.	..	⌇ all over.
30	29.093	85.9	85.7	80.8	W.	..	⌇ scattered.
31	29.085	85.9	85.0	79.5	W.	..	Hazy.
Mean.	29.109	84.7	84.9	82.3		3.65	

Barometer Observations corrected for Capillarity only.

Symbols.
- ⌇ Cirus.
- ⌇ Cirro strata.
- ⌇ Cumuli.
- ⌇ Cumulo strata.
- ⌇ Nimbi or Nimbus.

Meteorological Register kept at the Office of the Secretary to Government, N. W. P., Agra, for the month of July, 1855.

Observations at apparent Noon.							
Date.	Barometer.	Temperature.			Direction of Wind.	Quantity of Rain.	Aspect of the sky.
		Of Mercury.	Of Air.	Wet Bulb.			
1	29.039	90.0	90.9	83.0	E.	..	⌇ scattered.
2	29.021	82.5	82.0	80.0	N.	0.17	⌇ all over.
3	29.951	85.9	87.0	82.5	E.	..	⌇ scattered.
4	29.065	86.7	87.3	82.4	E.	..	⌇ ditto.
5	29.143	88.5	89.4	83.1	N. E.	..	⌇ all over.
6	29.121	89.0	89.7	84.0	N. E.	..	⌇ scattered.
7	29.105	89.9	90.5	85.0	W.	..	⌇ ditto.
8	29.083	86.0	85.5	81.9	N.	..	⌇ all over.
9	29.077	86.0	86.5	82.5	N.	..	⌇ ditto.
10	29.047	86.9	87.8	81.6	E.	..	⌇ ditto.
11	29.057	88.0	88.5	83.4	S. E.	..	⌇ scattered.
12	29.077	87.6	87.5	81.0	E.	..	⌇ ditto.
13	29.061	86.8	86.5	79.0	N. E.	..	⌇ ditto.
14	29.199	86.8	87.0	80.0	S. W.	..	⌇ ditto.
15	29.163	88.2	88.5	80.9	N. E.	..	~ ditto.
16	29.105	89.0	89.0	80.5	S. W.	..	⌇ ditto.
17	29.049	80.8	80.5	78.8	S. W.	..	⌇ all over.
18	29.065	82.9	82.5	80.3	E.	0.28	⌇ ditto.
19	29.101	86.5	86.6	81.0	N. E.	..	⌇ scattered.
20	29.107	86.5	87.4	82.6	E.	..	⌇ all over.
21	29.157	86.0	86.0	81.7	S. E.	..	⌇ ditto.
22	29.163	82.0	82.0	80.4	S. W.	..	⌇ ditto.
23	29.149	83.5	84.0	80.4	S. W.	..	⌇ ditto.
24	29.063	82.3	82.8	80.4	W.	..	⌇ ditto.
25	29.083	82.3	81.9	80.3	S. W.	0.22	⌇ ditto.
26	29.079	87.2	87.7	82.5	W.	..	⌇ ditto.
27	29.135	83.0	81.7	80.4	W.	0.72	⌇ ditto.
28	29.091	86.9	88.2	82.5	N. W.	..	⌇ scattered.
29	29.073	84.3	84.5	82.0	N. W.	0.84	⌇ all over.
30	29.089	88.9	88.9	82.0	W.	..	⌇ scattered.
31	29.073	88.0	88.0	80.8	W.	..	Hazy.
Mean.	29.090	86.0	86.0	81.5		2.23	

Meteorological Register kept at the Office of the Secretary to Government, N. W. P. Agra, for the month of July, 1855.

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Direction of Wind.	Quantity of Rain.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.			
1	28.989	84.5	84.0	81.2	90.5	80.0	85.25	∿ all over.	E.	0.62
2	28.969	82.8	82.0	80.0	84.0	79.9	81.95	∿ ditto.	N. W.	0.27
3	28.891	87.6	88.1	82.1	88.0	79.0	83.5	∿ scattered.	S. E.	0.12
4	29.025	89.0	89.3	82.3	89.0	79.8	84.4	∿ ditto.	E.	..
5	29.075	85.5	84.6	82.0	89.5	80.8	85.15	∿ all over.	W.	..
6	29.055	85.8	84.4	84.0	89.5	80.9	85.2	∿ ditto.	W.	2.17
7	29.049	87.7	87.4	84.5	90.5	80.5	85.5	∿ ditto.	W.	..
8	29.041	83.0	83.0	81.0	86.0	80.0	83.0	∿ ditto.	W.	0.22
9	29.009	86.8	86.8	83.2	86.5	78.0	82.25	∿ ditto.	N. W.	..
10	28.959	88.9	88.5	82.5	88.5	78.0	83.25	∿ ditto.	E.	..
11	28.979	88.0	87.5	83.6	88.0	79.8	83.9	∿ scattered.	S. E.	04.7
12	29.001	89.6	89.9	81.5	89.5	77.5	83.5	∿ ditto.	E.	..
13	29.015	88.9	89.0	81.0	88.9	79.8	84.35	∿ ditto.	N. E.	..
14	29.165	88.5	88.4	80.0	88.5	79.0	83.75	∿ ditto.	W.	..
15	29.105	91.0	91.2	82.0	91.0	80.5	85.75	∿ ditto.	N.	..
16	29.031	92.0	91.8	82.4	92.0	80.0	86.0	∿ ditto.	W.	..
17	29.993	81.9	82.0	79.6	82.0	79.5	80.75	∿ all over.	S. W.	0.69
18	28.989	86.8	87.2	81.6	87.4	79.5	83.45	∿ ditto.	W.	..
19	29.011	84.0	83.5	80.5	87.0	77.5	82.25	∿ scattered.	E.	..
20	29.071	82.0	82.2	80.5	86.0	77.5	81.95	∿ all over.	S.	1.17
21	29.069	81.0	81.6	79.4	85.5	78.5	82.0	∿ ditto.	S. W.	0.87
22	29.119	82.9	82.9	80.4	82.5	78.0	80.25	∿ ditto.	S. W.	..
23	29 053	84.0	85.0	81.0	84.5	77.8	81.15	∿ scattered.	N. W.	..
24	29.009	82.0	80.9	79.4	84.0	79.9	81.95	∿ all over.	W.	..
25	29.029	81.5	81.5	79.5	81.5	77.0	79.25	∿ ditto.	N. W.	..
26	29.041	81.5	80.6	79.4	88.0	76.5	82.75	∿ ditto.	N.	0.12
27	29.087	87.9	87.9	82.8	87.0	78.5	82.75	∿ ditto.	W.	..
28	29.035	91.8	92.3	84.6	91.5	79.0	85.25	∿ scattered.	N. W.	..
29	28.997	89.9	90.2	84.5	89.5	79.0	84.25	∿ ditto.	N. W.	..
30	29.033	92.0	92.4	83.0	91.5	80.2	85.85	∿ ditto.	W.	..
31	29.017	91.3	91.1	80.8	90.5	80.0	85.25	∿ ditto.	W.	..
Mean.	29.050	86.6	89.5	81.6	87.6	79.0	83.39			6.72